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ABSTRACT

A project to implement the Illinois Plan for Industrial Technology Education produced four major accomplishments: (1) 13 workshops were held on Communication Technology and Energy Utilization Technology; (2) workshop activity packets were produced in both subject areas; (3) a "Futuring Committee" was established that outlined a 10-year plan for enhancing industrial technology education in Illinois; and (4) four issues of the newsletter "Technology News Today" were published and disseminated. The project concluded that there is a strong need for more inservice training for technology education orientation-level teachers. Several recommendations emerged: university personnel should provide joint inservice training through regional university courses or summer retreats/weekends; hands-on workshops should be provided statewide; and exemplary teachers and programs should be highlighted. (The bulk of this document consists of four appendices: (1) workshop schedule, flyers, and evaluations; (2) third-party evaluation of orientation-level program; (3) Futuring Committee report; and (4) "Technology News Today," Volume 6, Numbers 1-4.) (NLA)

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IL91C008

Illinois Plan for Industrial Technology Education:

FY91 Final Report

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Vocational Education Program Improvement Section

July, 1991

PLAC22D

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Appendix

A. Workshop Schedule, Flyers, and Evaluations

B. External Evaluation

C. Futuring Committee Report

D. Technology News Today

a. FINAL REPORT ABSTRACT

Project Title: Illinois Plan for Industrial Technology Education
Department of Adult, Vocational and Technical Education Funding Agreement Number: PLAC22D
Project Director: Franzie L. Loepp
Funded Agency: Illinois State University
Location of Funded Agency: Normal, Illinois
Time Period Covered: July 1, 1990 - June 30, 1991
Goal(s) of the Project and its Relevancy to Vocational Education:

Goals

1. To prepare and document hands-on activities for seven workshops on Communication Technology and seven similar workshops on Energy Utilization Technology to be conducted in strategic locations in the state.
   The orientation workshop series and related communication materials helped teachers and administrators develop ISBE/DAVTE approved orientation-level programs.
2. To facilitate activities of a long range planning task force that will develop future goals and objectives for industrial technology education programs in Illinois.
   The Futuring Committee Report revises efforts to develop a comprehensive Kindergarten through adult industrial technology education curriculum plan. This report will help focus curriculum and professional development activities through the year 2000.
3. To publish four issues of the "Technology News Today" newsletter for industrial technology education teachers (Volume VI).
   The TNT is widely read by teachers and administrators throughout the state. This publication is an excellent way to communicate current events and trends related to industrial technology education.
4. To respond to telephone and mail requests regarding professional development activities that relate to industrial technology education.
   Through telephone and written requests, teachers and administrators were kept abreast of current curriculum materials and professional development activities.

Major Accomplishments of the Project:
Thirteen hands-on workshops were held (Communication Technology and Energy Utilization Technology). One workshop was cancelled because of low enrollment. Activity packets were produced for both Communication and Energy Utilization Technologies. A Long Range Planning Task Force was established and outlined a ten year plan for enhancing industrial technology education. Four issues of the Technology News Today were published and disseminated.

Products Delivered:

Title	Type	Quantity	Recipients	Date of Delivery
Technology News Today	Newsletter	3,300 per issue	Teacher educators Teachers Adminstrators Counselors	October, 1990 December, 1990 March, 1991 May, 1991
Communication Technology Curriculum Materials FY 91	Learning Activity Guide	600	Teachers, administrators	October, 1990
Energy Utilization Technology Curriculum Materials FY 91	Learning Activity Guide	400	Teachers Administrators	January, 1991
Futuring Committee Report	Report	100	Management, ISBE	June, 1991

b. **MAJOR ACCOMPLISHMENTS AND SIGNIFICANT FINDINGS OF THE PROJECT:**

1. Project goals, objectives, and description of activities and accomplishments:

Prepare and document hands-on activities for seven workshops on Communication Technology and seven similar workshops on Energy Utilization Technology to be conducted in strategic locations in the state.

Arrange for fall workshops on Communication Technology and spring workshops on Energy Utilization Technology to be held in Galesburg, Rockford, Chicago, Springfield, Oak Lawn, Mt. Vernon, and Arlington Heights; develop and document hands-on activities to be presented at the workshops, and identify and arrange for teachers in the areas to assist with the workshops.

The following workshops were held for Communication Technology and Energy Utilization Technology:

Communication Technology:

Oct. 17, 1990	*Chicago* *Dunbar Vocational Center*
Oct. 31, 1990	*Arlington Heights* *Forest View Ed. Center*
Nov. 7, 1990	*Blue Island* *Eisenhower High School*
Nov. 28, 1990	*Springfield* *Capital Area Voc. Center*
Dec. 6, 1990	*Galesburg* *Galesburg High School*
Dec. 12, 1990	*Mt. Vernon* *Mt. Vernon High School*

Energy Utilization Technology:

Feb. 6, 1991	*Mt. Vernon* *Mt. Vernon High School*
Feb. 21, 1991	*Arlington Heights* *Forest View Ed Center*
Mar. 1, 1991	*Galesburg* *Galesburg High School*
Mar. 6, 1991	*Springfield* *Area Voc Center*
Mar. 13, 1991	*Rockford* *Rock Valley College* *Technology Center*
April 11, 1991	*Oaklawn* *H. L. Richards High School*
April 17, 1991	*Chicago* *Dunbar Vocational Center*

Workshop schedules were mailed to system directors and IMCs requesting they notify teachers of workshops. Announcements appeared in the September, December, and March issues of Technology News Today newsletter. Activity packets were developed and printed, and copies were given to workshop participants. Vendors were contacted to present at workshops. Activities were planned to present at workshops and materials purchased to support activities (Appendix A).

Furthermore, this year concluded three years of curriculum development, designed to revise and enhance previously developed materials. Subsequently, two sets of materials including an implementation guide, an orientation curriculum guide, a set of activity packets (e.g., communication, energy utilization, production, and transportation), and a set of Technology News Today newsletters were sent to each state university. It was suggested that one set of materials be placed within the department, and the other set placed within the university library. Additional sets of materials were forwarded to DAVTE staff.

Facilitate activities of a long range planning task force that will develop future goals and objectives for industrial technology education programs in Illinois.

Form a long range planning task force and develop a five to ten year strategic plan for curriculum development, inservice, curriculum integration, public relations, and program evaluation.

Before planning the future, a review and assessment of existing and past initiatives was needed. Thus, an external evaluation was completed and submitted by the Applied Expertise Associates at Columbia, Missouri (Appendix B).

An organizational meeting was held on July 10, 1990 at Illinois State University. Attending were Chuck Windhorst, Ron Engstrom from Department of Adult Vocational and Technical Education and Dennis Gallo, Illinois Plan for Industrial Technology Education. An additional meeting was held on August 17, 1990 at the Illinois State Board of Education in Springfield attended by Ron Engstrom, John Kopatz, and Dennis Gallo.

The Illinois State Board of Education sent letters to selected teachers requesting their participation on the task force. The first meeting of the task force was scheduled for November 1, 1990, at Illinois State Board of Education/Department of Adult Vocational and Technical Education. Permission was sought and granted to provide lunch for participants at Lincoln Plaza Hotel in Springfield. Planning sessions for future meetings were held at the Illinois State Board of Education, Springfield, on November 30 and December 13.

A letter dated March 11, 1991 was generated by Project staff and DAVTE consultants and mailed to task force members. Because of the cost of bringing the task force together, it was decided to mail each member materials requesting their reaction. Two mailings were completed, and the Task Force then met again on May 15. Subsequently, a Futuring Committee Report was compiled and completed (Appendix C).

A videotape titled, "Developing a Technology Education Program: A Series of State Reports" was made to document the evolution of technology education in Illinois (available upon request from IVCC).

Publish four issues of the "Technology News Today" newsletter for industrial technology education teachers (Volume VI).

Utilizing the newsletter format from 1986-90, write, design, print and distribute 3,300 newsletter to industrial technology education teachers, counselors, and administrators throughout Illinois.

Volume VI, Numbers 1-4 of the Technology News Today *newsletter were written by project staff. The material was then entered on a word processor and transferred to a desktop publishing system for typesetting. Design work was completed by ComUnigraph, Inc. Printing was completed by the University Printing Service, labels attached, and mailed (Appendix D).*

In Volume VI, Number 1, a video contest was advertised, whereby entrants would have the opportunity to win between $100 and $300 for their entry. Two videotapes were received, and the first place prize was awarded to Bruce Logsdon at Litchfield High School. Second place went to Ed Schmidt of Putnam County High School.

Respond to telephone and mail requests regarding professional development activities that relate to industrial technology education.

Respond to requests from teachers and administrators throughout the state who solicit support for technology education curriculum, facilities, or staff development.

Project staff continually responded to calls from administrators and teachers from Illinois, as well as from out-of-state. In each case, the clients were either provided with materials or directed to human or material sources to help them.

A special visit was made to Plainfield High School to begin the process of curriculum revision and facility planning for the anticipated rebuilding of their plant due to tornado destruction.

Extended inservice was developed and conducted for secondary teachers in the Delabar region during September and October. The inservice was designed to help teachers refocus their curriculum to reflect current curriculum initiatives.

On April 4, project staff visited and delivered a one-day inservice to eighth grade students on energy utilization at Franklin Middle School in Champaign.

On May 23, project staff visited Batavia Junior High School in order to help them plan and update their program.

Extended inservice was planned and conducted for industrial teachers at Lombard Junior High School. The purpose of the inservice was to help teachers expand and update their programs to reflect current curriculum initiatives.

2. Products Abstract:

Communication Technology Curriculum Materials

A set of 35 hands-on communication-related learning activities to compliment the Industrial Technology Curriculum Guide (1989). Included are action-based activities that reinforce the concepts in the areas of drafting and design, photography, graphic arts, processing and communicating information with computers, and telecommunications technology. Each activity contains an introduction, related supplies, problem statement, activity procedures, activity analysis, transparency masters, and drawings.

Energy Utilization Curriculum Materials

A set of 30 hands-on energy utilization-related learning activities to compliment the Industrial Technology Curriculum Guide (1989). Included are action-based activities that reinforce the concepts in the areas of energy conversion and transmission systems, fossil fuels and energy conservation, solar energy, and using alternate energy sources. Each activity contains an introduction, related supplies, problem statement, activity procedures, activity analysis, transparency masters, and drawings.

Technology News Today

A professionally designed six-panel newsletter that features successful programs around the state, reviews new software, announces inservice activities, describes new learning activities and keeps the reader up-to-date on the latest developments in the Illinois State Board of Education/Department of Adult, Vocational and Technical Education. This newsletter has a circulation of more than 3,000 industrial technology education teachers, administrators, counselors, and teacher educators.

Futuring Committee Report

A report outlining a plan for enhancing and improving industrial tehcnology education through the year 2000. The committee report suggests goals and objectives for the four educational levels of awareness (K-5), exploration (6-8), orientation (9-10), and preparation (11-adult). The report included strategies for curriculum and professional development and public relations activities. Further, the committee report establishes a timeline, identifying short, medium, and long range goals and suggestions for periodic evaluation.

c. **EVALUATION AND IMPACT:**

A. Communication Technology Workshops:

The following statements summarize the responses of 259 participants completing evaluation forms. A complete summary of data is provided in Appendix A.

1. **Forty percent strongly agreed** the learning activities displayed during the Technology Resource session were good enough to try with students; **54% agreed**; 3% were undecided; and 2 percent disagreed.

2. **Thirty-four percent strongly agreed** the content and activities presented during the resource session could be used to help teach students about the concepts of Communication Technology; **62% agreed**; and 3% were undecided.

3. **Thirty-nine percent strongly agreed** the learning activities presented during the hands-on activity session were good enough to try with students; **54% agreed**; 5% were undecided; and 3% disagreed.

4. **Thirty-three percent strongly agreed** the hands-on activity session will help students learn about and reinforce concepts like design, image carriers, CAD, animation, electronic publishing, and computer imaging; **63% agreed**; and 4% were undecided.

5. When asked to provide an evaluation of the technology resource session, **24% responded excellent; 59% responded above average**; 15% responded average; and 2% responded below average.

6. The evaluation of the hands-on activity session were as follows: **26% responded excellent; 52% responded above average**; and 21% responded average.

7. **Thirty percent responded excellent** as the overall evaluation of the workshop; **53% responded above average**; 15%, average; and 1%, below average.

8. Eleven percent of the participants teach junior high school, 41% teach 9th and 10th grades; 43% teach 11th and 12th grades; and 2% were vocational administrators or directors.

9. Twenty-four percent of the participants had never attended an Illinois Plan workshop; 60% attended last year; 8% attended two years ago; 4% attended three years ago; and 4% attended longer ago that four years.

10. Those currently teaching courses related to technology or industrial technology education equaled 91%; 9% were not teaching related courses.

11. Thirty-eight percent related they teach communication technology courses; 17%, energy utilization technology; 25%, production technology; and 19%, transportation technology.

12. Those participants teaching 0-5 years equaled 10%; 6-10 years, 7%; 11-15 years, 10%; 16-20 years, 19%; 21-25 years, 27%; 26-30 years, 19%;, and more than 30 years, 8%.

13. **Ninety-eight percent responded** they would like to see other workshops developed in the future for the content areas associated with the Illinois Plan; 2% would not.

14. The participants would like to see workshop developed for the following areas: communication technology, 16%; energy utilization technology, 20%; production technology, 13%; and transportation technology, 48%.

15. Those currently receiving the Technology News Today newsletter equaled 84%. with 16% not receiving it.

16. **Ninety-eight percent felt the TNT should be continued**; 2% do not.

B. Energy Utilization Technology workshops:

The following statements summarize the responses of 242 participants completing evaluation forms. A complete summary of data is provided in Appendix A.

1. **Fifty-six percent strongly agreed** the learning activities displayed during the Technology Resource session were good enough to try with students; **44% agreed**; 3% were undecided; and 2 percent disagreed.

2. **Forty-six percent strongly agreed** the content and activities presented during the resource session could be used to help teach students about the concepts of Energy Utilization Technology; **51% agreed**; and 3% were undecided.

3. **Fifty-four percent strongly agreed** the learning activities presented during the hands-on activity session were good enough to try with students; **42% agreed**; and 3% were undecided.

4. **Fifty-nine percent strongly agreed** the hands-on activity session will help students learn about and reinforce concepts like design, image carriers, CAD, animation, electronic publishing, and computer imaging; **39% agreed**; and 2% were undecided.

5. When asked to provide an evaluation of the technology resource session, 32% **responded excellent; 50% responded above average**; 16% responded average; and 2% responded below average.

6. The evaluation of the hands-on activity session were as follows: **39% responded excellent; 36% responded above average**; and 25% responded average.

7. **Thirty-seven percent responded excellent** as the overall evaluation of the workshop; **46% responded above average**; 16%, average; and 1%, below average.

8. Thirteen percent of the participants teach junior high school, 40%, 9th and 10th grades; 40%, 11th and 12th grades; 2% were vocational administrators or directors; and 4% represented other areas.

9. Fourteen percent of the participants had never attended an Illinois Plan workshop; 46% attended the Communication Technology workshop in the fall; 36% attended last year; 2% attended two years ago; and 2% attended three years ago.

10. Those currently teaching courses related to technology or industrial technology education equaled 89%; 11% were not teaching related courses.

11. Those participants teaching 0-5 years equaled 11%; 6-10 years, 7%; 11-15 years, 16%; 16-20 years, 22%; 21-25 years, 28%; 26-30 years, 10%;, and more than 30 years, 6%.

12. **Ninety-nine percent responded** they would like to see other workshops developed in the future for the content areas associated with the Illinois Plan; 1% would not.

13. The participants would like to see workshops developed for the following areas: communication technology, 25%; energy utilization technology, 15%; production technology, 26%; transportation technology, 27%; and other, 7%.

14. Those currently receiving the Technology News Today newsletter equaled 81%, with 19% not receiving it.

15. **Ninety-seven percent felt the TNT should be continued**; 3% do not.

d. **RESOURCE LISTING:**

1. Material Resources: The materials purchased for use by the project can be classified as "expendable." They were utilized by workshop participants during hands-on activities, and/or were made available to teachers upon request.

2. Human Resources (Paid):

Name	Position	Agency	Contribution
Franzie Loepp	Director	ISU	Director of IPITE
Dennis Gallo	Workshop Coord.	ISU	Coordinated and conducted inservice activities; coordinated Futuring committee activities
Sarah Dolan	Secretary	ISU	Secretarial duties
Arthur Weidner	Instructor	Rolling Meadows	Assisted at workshop
Gary Vermilyea	Instructor	Blue Mound H.S.	Assisted at workshop
Peter Tucker	Instructor	Highland H.S.	Assisted at workshop
Michael Moutray	Instructor	Peru, IL	Assisted at workshop
Robert Pyevich	Instructor	United Twnshp. H.S.	Assisted at workshop
Jim Baker	Instructor	H. L. Richards H.S.	Assisted at workshop
Richard Bunton	Instructor	Rochelle, IL	Assisted at workshop
James McDonald	Instructor	Elk Grove H.S.	Assisted at workshop
Don Reynolds	Instructor	Ball-Chatham USD	Assisted at workshop
David Doering	Instructor	Ball-Chatham USD	Assisted at workshop
Fred Lipp	Instructor	Williamsville H.S.	Assisted at workshop
Paul Kane	Instructor	Rolling Meadows H.S.	Assisted at workshop
Wm. Winternheimer	Instructor	Mr. Carmel H.S.	Assisted at workshop
David DeWulf	Instructor	Murphysboro, IL	Assisted at workshop

Human Resources (Unpaid):

Ron Engstrom	Ind. Consultant	DAVTE	Moderator
John Kopatz	Ind. Consultant	DAVTE	Moderator
Chuck Windhorst	Ind. Consultant	DAVTE	Moderator
Max Lude	Instructor	Eldorado H.S.	Committee member
Leonard Alwardt	Instructor	Nashville H.S.	Committee member
Daryl Floit	Instructor	Morton Jun. H.S.	Committee member
Harry Tobin	Voc. Director	Chicago Bd. of Ed.	Committee member
Grant Winsauer	Voc. Director	Twnshp. H.S.D. 214	Committee member
Eugene Willimann	Systems Director	West Central Reg.	Committee member
Brent Steel	Comm. Coll. Inst.	Elgin Comm. College	Committee member
Scott Johnson	Tech. Educator	U of I	Committee member
Roger Sturm	System Director	United Twnshp H.S.	Committee member
Mike Roth	Instructor	West Middle School	Committee member
Mary Waters	IMC	Tri Co. Ed. Serv.	Curriculum support
Judy Warthen	IMC	Region II	Curriculum support
Donna Luallen	IMC	Region III	Curriculum support
Ethel Pichon	IMC	Region IV	Curriculum support
Brenda Yates	IMC	Egyptian Ed. Service	Curriculum support
Tom Sweatman	IMC	Ill. Voc. Curric. Center	Curriculum support
Donald Smoot	IMC	Rantoul	Curriculum support
Randi Maxfield	Curriculum Spec.	IVCC	Curriculum Support
Jerry Aklyoshi	Vendor	Naperville	Vendor support
Bruce Hunt	Vendor	Energy Concepts	Vendor support
Michael McGough	Vendor	Lab-Volt	Vendor support
Dan Naylor	Vendor	Wisconsin	Vendor support
James Ortman	Vendor	TII Robotics	Vendor support
Kim Purcell	Vendor	IBM	Vendor support
Bruce Ramsden	Vendor	Paxton Patterson	Vendor support
Gary Rockis	Vendor	Aidex	Vendor support
Andrew Schweizer	Vendor	Connecting Point	Vendor support
John Abel	Voc. Director	Galesburg	Facilitator
Earl Jeffers	Asst. Supt.	Mt. Vernon	Facilitator
Lou Komer	Voc. Coord.	District 218	Facilitator
Leonard Modder	Voc. Coord.	Chicago	Facilitator
Julie Nichols	Systems Director	Rockford	Facilitator
Jerry Scranton	Systems Director	Springfield	Facilitator
Ted Strand	Voc. Coord.	District 214	Facilitator

e. **PROBLEMS:**
Regarding workshops, two problems occurred. Even though a great deal of time went into publicizing and selecting sites, the first workshop at Rockford had to be cancelled due to low enrollment. Likewise, the impact in the Chicago and suburban sites did not match up with the potential for that part of the state.

f. **CONCLUSIONS AND RECOMMENDATIONS:**

Illinois Plan for Industrial Technology Education Workshops

Conclusion:

A significant number of industrial technology education orientation-level teachers need further preparation to teach the new curricula. Many of them are uncomfortable with the content, concepts and activities surrounding a new technology-based curriculum. Most conventional industrial arts teachers have been trained in two or three narrowly focused content areas. Technology education requires them to expand their thinking to include areas in which they have little or no formal training. Therefore, there is a strong need for more inservice.

Recommendation:

University personnel throughout the state should be mobilized to provide joint inservice in the areas of technical skills updating and curriculum development. In other words, update teachers in their knowledge of new technologies (robotics, fiber optics, automated systems, etc.) and then teach them how to take the skills learned and make them generalizable for students. Additionally, such inservice should provide a philosophical understanding of technology-based activities, teach innovative instructional techniques (simulation, problem solving, creative thinking, modeling, etc.), introduce employability skills, discuss student organizations and investigate implementation strategies.

The inservice should be delivered through regional university courses, or technology-based weekends or summer retreats established. Several state universities should design a series of technology-based courses and throughout the year, each different course should be rotated to other universities throughout the state; thus, allowing teachers all over the state to receive ongoing regional inservice.

Secondly, extended hands-on workshops (with more secondary teachers in leadership roles) should be provided throughout the state in all four content areas.

Additionally, exemplary teachers and programs should be highlighted at various local and regional inservice meetings throughout the state. The inservice should focus on the implementation strategies and activities utilized by exemplary teachers to deliver effective industrial technology education programs to students.

Futuring Committee

Conclusion:

A significant amount of curriculum and professional development took place throughout the 1980s. Still, much remains to be done. The Futuring Committee Report establishes a set of goals and objectives which will extend the momentum of past initiatives through the year 2000. The report identifies strategies for curriculum and professional development and public relations activities. Additionally, the report establishes a timeline, identifying short, medium, and long-range goals as suggestions for periodic evaluation.

Recommendation:

The goals and objectives set forth in the Futuring Committee Report should be utilized to enhance future curriculum and professional development activities. Particular attention should be focused toward the development of awareness and exploration-level materials. The absence of materials at this level has left a void which may impede the development of a consistent, well articulated Kindergarten through adult curriculum.

g. **APPENDIX**

APPENDIX A

Workshop

Schedule, Flyers, and Evaluations

1990-91 Illinois Plan
For Industrial Technology Education
Workshop Schedule

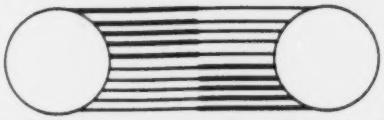
Communication Inservice Schedule

DATE:	LOCATION	TIME
Oct. 2, 1990	Rockford Rock Valley College Technology Center	9:30 - 3:00
Oct. 17, 1990	Chicago Dunbar Vocational Center	4:30 - 8:00
Oct. 31, 1990	Arlington Heights Forest View Ed. Center	9:30 - 3:00
Nov. 7, 1990	Blue Island Eisenhower High School	9:00 - 3:00
Nov. 28, 1990	Springfield Capital Area Voc. Center	12:00 - 4:30
Dec. 6, 1990	Galesburg Galesburg High School	12:00 - 4:30
Dec. 12, 1990	Mt. Vernon Mt. Vernon High School	9:30 - 3:00

Energy Utilization Inservice Schedule

Feb. 6, 1991	Mt. Vernon Mt. Vernon High School	9:30 - 3:00
Feb. 21, 1991	Arlington Heights Forest View Ed Center	9:30 - 3:00
Mar. 1, 1991	Galesburg Galesburg High School	8:30 - 1:00
Mar. 6, 1991	Springfield Area Voc Center	12:00 - 4:30
Mar. 13, 1991	Rockford Rock Valley College Technology Center	9:30 - 3:00
April 11, 1991	Oaklawn H. L. Richards High School	9:00 - 3:00
April 17, 1991	Chicago Dunbar Vocational Center	4:30 - 8:00

COMMUNICATION TECHNOLOGY:



KEEPING TODAY'S STUDENTS IN TOUCH WITH TOMORROW.

1990 ILLINOIS PLAN FOR INDUSTRIAL TECHNOLOGY EDUCATION COMMUNICATION TECHNOLOGY WORKSHOPS

FOCUS

The 1980's brought the unprecedented development of communication-related technologies. Communication systems are faster, cheaper, and more reliable than ever before. Various communication systems impact nearly all facets of students' daily lives, from making phone calls over fiber optic lines or cellular networks, to watching hundreds of news, entertainment and educational programs with cable (soon to be high definition) television, to saving special moments with digital camera, to accessing and processing information using the latest computer system.

Since the capabilities of existing communication systems have expanded so rapidly and will continue to do so, it has become increasingly important to learn how to utilize the technology to record, send, receive, and process information. Students are living in an "Information Age" and have become a society which seeks new and better ways to communicate. It is education's responsibility to teach students how to adapt, cope, and use this new emerging technology.

SESSIONS

Workshop schedule: Oct. 2, Rockford; Oct. 17, Chicago; Oct. 31, Arlington Hts.; Nov. 7, Blue Island; Nov. 28, Springfield; Dec. 6, Galesburg; and Dec. 12, Mt. Vernon. During the workshops, teachers will rotate through several sessions. The Communication workshop will include:

Session (A) Title: Communication Technology: An Overview

Description - This session will provide participants with a conceptual understanding of Communication Technology. In addition, teachers will be exposed to current and future trends in communication related technologies.

Session (B) Title: Resources in Communication Technology

Description - During this session, teachers will interact with various resource people and materials (e.g., curriculum, software, textbooks). In addition participants will receive technical instruction on such topics as electronic publishing, animation, and electronic imaging. Finally, with support from area vendors, the session will conclude with an opportunity for the participants to see and use the latest communication technologies.

Session (C) Title: Teaching Communication Technology Through Hands-on Activities

Description - During this session, teachers will engage in a variety of hands-on activities. These activities include electronic imaging, thermal screen printing, animation, and electronic publishing. In addition, participants will have the opportunity to learn from teachers in the field who are currently teaching communication technology.

REGISTRATION

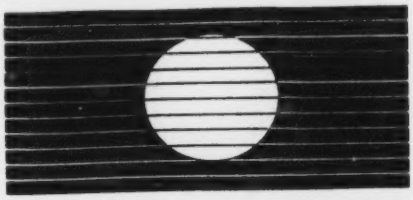
Because of the facilities required to conduct the type of inservice described above, enrollment will be LIMITED TO THE FIRST ONE-HUNDRED people per workshop. Therefore, ALL PARTICIPANTS MUST PRE-REGISTER. Registration will not be conducted on the day of the workshop. Please use the pre-registration form attached, and check the workshop you would like to attend. Then, send the form, along with $15.00 (make all checks payable to Illinois State University) to Dennis Gallo, Illinois State University, 210 Turner Hall, Normal, Illinois 61761. Since registration will not be accepted after the deadlines (see pre-registration form below), be sure to register early.

PRE-REGISTRATION FORM

NAME _____ SCHOOL _____ PHONE (___) _____

STREET ADDRESS _____ CITY _____ STATE _____ ZIP _____

- ☐ Oct. 2, Rockford (Pre-registration deadline, Sept. 18)
- ☐ Oct. 17, Chicago (Pre-registration deadline, Oct. 3)
- ☐ Oct. 31, Arlington Heights (Pre-registration deadline, Oct. 17)
- ☐ Nov. 7, Blue Island (Pre-registration deadline, Oct. 24)
- ☐ Nov. 28, Springfield (Pre-registration deadline, Nov. 14)
- ☐ Dec. 6, Galesburg (Pre-registration deadline, Nov. 22)
- ☐ Dec. 12, Mt. Vernon (Pre-registration deadline, Nov. 28)



ENERGY UTILIZATION TECHNOLOGY:

LIGHTING THE PATH TO A BRIGHTER FUTURE

1990 ILLINOIS PLAN FOR INDUSTRIAL TECHNOLOGY EDUCATION
ENERGY UTILIZATION TECHNOLOGY WORKSHOPS

FOCUS

Since the oil embargo in the early 70's, energy has become a major concern to our nation. Over the past two decades, our society has dealt with gas shortages, numerous conservation programs, unstable fuel prices, depleting world finite resources, and an increased demand for energy. We live in a society dependent on various modes of transportation, automated production processes, sophisticated communication systems, and time-saving devices, all of which use large amounts of energy. As our society becomes more energy conscious, the move toward alternative energy sources and conservation techniques have become more apparent.

The demand for more energy has created a need to educate our students about the reality of the energy situation. In doing so, students who become involved in learning about traditional fossil fuels, conservation techniques, and alternative energy sources can develop a better understanding of the applications and their impacts on society.

SESSIONS

Workshop schedule: Feb. 6, Mt. Vernon; Feb. 21, Arlington Hts.; Mar. 1, Galesburg; Mar. 6, Springfield; Mar. 13, Rockford; April 11, Oaklawn; and April 17, Chicago. During the workshops, teachers will rotate through several sessions. The Energy Utilization workshop will include:

Session (A) Title: Energy Utilization Technology: An Overview

Description - This session will provide participants with a conceptual understanding of Energy Utilization Technology. In addition, teachers will be exposed to current and future trends in energy-related technologies.

Session (B) Title: Resources in Energy UtilizationTechnology

Description - During this session, teachers will interact with various resource people and materials (e.g., curriculum, software, textbooks). In addition, participants will have the opportunity to learn from teachers in the field who are currently teaching energy-related topics and curriculum. Finally, with support from area vendors, the session will conclude with an opportunity for the participants to see and use the latest energy utilization technologies.

Session (C) Title: Teaching Energy Utilization Technology Through Hands-on Activities

Description - During this session, teachers will engage in a variety of hands-on activities. These activities include passive and active solar energy, geothermal power, hydroelectric power, and wind power.

REGISTRATION

Because of the facilities required to conduct the type of inservice described above, enrollment will be LIMITED TO THE FIRST ONE-HUNDRED people per workshop. Therefore, ALL PARTICIPANTS MUST PRE-REGISTER. Registration will not be conducted on the day of the workshop. Please use the pre-registration form attached, and check the workshop you would like to attend. Then, send the form, along with $15.00 (make all checks payable to Illinois State University) to Dennis Gallo, Illinois State University, 210 Turner Hall, Normal, Illinois 61761. Since registration will not be accepted after the

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PRE-REGISTRATION FORM

NAME_____ SCHOOL_____ PHONE (___) _____

STREET ADDRESS_____ CITY_____ STATE_____ ZIP _____

- ☐ Feb. 6, Mt. Vernon (Pre-registration deadline, Jan. 23) 9:30 am-3:00 pm
- ☐ Feb. 21, Arlington Heights (Pre-registration deadline, Feb. 7) 9:30 am-3:00 pm
- ☐ Mar. 1, Galesburg (Pre-registration deadline, Feb. 15) 8:30 am-1:00
- ☐ Mar. 6, Springfield (Pre-registration deadline, Feb. 20) 9:30 am-3:00 pm
- ☐ Mar. 13, Rockford (Pre-registration deadline, Feb. 27) 9:30 am-3:00 pm
- ☐ Apr. 11, Oaklawn (Pre-registration deadline, Mar. 28) 9:00 am-3:00 pm
- ☐ Apr. 17, Chicago (Pre-registration deadline, Apr. 3) 4:30 pm-8:00 pm

COMMUNICATION TECHNOLOGY
WORKSHOP EVALUATION SUMMARY
FY 91

Directions: Read the following directions carefully. Respond to each statement by circling either strongly agree (SA), agree (A), undecided (U), disagree (D), strongly disagree (SD).

1. The learning activities presented during the **Communication Technology Resource** session were good enough for me to try with my students.

SA	A	U	D	SD
40%	54%	3%	2%	

2. The content and activities (e.g., teacher discussion, vender equipment, curriculum material and resources) presented during the **Communication Technology Resource** session can be used to help teach students about the concepts of Communication Technology (e.g., CAD, lasers, animation, graphic arts, electronic publishing, etc.)

SA	A	U	D	SD
34%	62%	3%		

3. The learning activities presented during the **Teaching Communication Technology Through Hands-on Activity** session were good enough for me to try with my students.

SA	A	U	D	SD
39%	54%	5%	3%	

4. The learning activities presented during the **Teaching Communication Technology Through Hands-on Activity** session will help students learn about and reinforce concepts like design, image carriers, CAD, animation, electronic publishing, and computer imaging.

SA	A	U	D	SD
33%	63%	4%		

Directions: Read the following statements carefully. Respond to each statement by circling the letter F if you felt the session was poor, the letter D if you felt the session was below average, the letter C if you felt the session was average, the letter B if the session was above average, or the letter A if the session was excellent.

5. What is your evaluation of the **Communication Technology Resource** session?

Poor	Below Average	Average	Above Average	Excellent
F	D	C	B	A
	2%	15%	59%	24%

6. What is your evaluation of the **Teaching Communication Technology Through Hands-on Activity** session?

Poor	Below Average	Average	Above Average	Excellent
F	D	C	B	A
		21%	52%	26%

7. What is your overall evaluation of the Communication Technology workshop?

Poor	Below Average	Average	Above Average	Excellent
F	D	C	B	A
	1%	15%	53%	30%

Directions: Read each statement carefully. Circle the letter of the **ONE** item that best reflects your feelings. Please indicate any comments you would like to make.

8. Which of the following statements best describes your position?

11% A.I teach junior high
41% B. I teach 9th and 10th grade
43% C. I teach 11th and 12h grade
2% D. I am a vocational administrator or director.
E. I am a school principal.
F. I am a school superintendent.
2% G. Other

9. When did you last attend an Illinois Plan for Industrial Technology Education workshop?

24% A. I have never attended an Illinois Plan workshop.
60% B. Last year.
8% C. Two years ago.
4% D. Three years ago.
4% E. Longer than four years.

Comment:
I should make plans to attend more.
Looking forward to the Energy Workshop in February

10. Are you currently teaching any courses related to technology or industrial technology education?

91% A. Yes
9% B. No

Comment:
Student teacher
Commercial Art
Exploring Technology classes freshman level
Implementing bit by bit, CO2 cars, mass productions, paper cars, soda bottle rockets

Intro to CAB
Mouse trap cars - Production, Communication, Transportation
Electronic Technology
Introduction to Technology
Will be in 2 years
Trying to get something started.
Are all in the transition stage from I.A. toward the Math/Sciences focus of Technology Education?
Graphics, Auto
I'm trying to implement technology into my 9th grade survey class.
If you answered yes to question #10, then please answer the following question.

11. Which of the following areas best describes the types of technology courses you teach?

38%	A.	nmunication Technology
17%	B.	rgy Utilization Technology
25%	C.	duction Technology
19%	D.	nsportation Technology

Comme
All of the ove
Al' are utilized in the introductory course
Illinois Plan
Only teacher
Teaching general courses - eventually will teach technology in all areas.
Tech & You Program for student at risk.
1 full year progran.
Writing new curriculum
All
All are in alternate years

12. Which of the following statements best describes the numbers of years you have been teaching?

10%	A.	0-5 years
7%	B.	6-10 years
10%	C.	11-15 years
19%	D.	16-20 years
27%	E.	21-25 years
19%	F.	26-30 years
8%	G.	more than 30 years

13. Would you like to see other workshops developed in the future for the content areas associated with the Illinois Plan for Industrial Technology Education?

98%	A.	Yes
2%	B.	No

If you answered yes to question #13, please answer the following question.

14. Which of the following areas would you like most to see a workshop developed for?

16% A. Communication Technology
20% B. Energy Utilization Technology
13% C. Production Technology
48% D. Transportation Technology
E. Other _____

Manufacturing
How shall we address Bio-Related instruction within the II Plan model? Shall the areas (A&B) be fused together or ----------?
All

Comments:
More detail (examples of projects/activities).
Specific topics in Energy Utilization Technology.
I plan to go to the Spring Energy Tech

Think about running all four programs again -- Some teachers were not able to attend all four sessions.
4+2+2 Plan
Plastics Technology
Technology updates - all areas
Plan to attend one workshop this spring
After going through all 4 areas I would like to see a "refresher on new ideas" offered.
Manufacturing
Commercial Art, Video
I have attended the other two
More in detail
Update on all of them
Nuclear power
As of 2/90, I will have been to a workshop on each. I would like to see a continuation of these. Not repeats, but new activities, etc.

15. Are you currently receiving the **Technology News Today** (TNT) newsletter?

84% A. Yes
16% B. No

If you answered yes to question #15, please answer the following question.

16. Do you feel the TNT should be continued in the future?

98% A. Yes
2% B. No

Comments:
Very useful
Very helpful
Excellent
Great resource - nicely done

I have ideas from TNT to be incorporated into future lesson plans
Very informative

17. Further comments:
Enjoyed the workshop
Thanks
Have electrical sources available for all computers. Computer memory power should be adequate for program demonstrated.
GREAT - espesically Hands-On (for ideas and exposure)
Excellent source of information
It helps to see what other teachers are doing. Everybody should attend 1 or 2 of these a year.
Good experience for those involved directly in the teaching end of technology.
Need more equipment so others may try computer programs.
Although you do not promote software, a few more computers available to work with the programs would be nice.
Dennis Gallo does and excellent job.
Very educational day - keep up the good work.
Good workshop
TNT is one of the best ways to communicate I have seen. It really helps to keep me up on workshops and conventions. It could be enlarged (national conventions.)
Thank you
This session was very well organized and presented. It is workshops like this that will help generate the enthusiasm which will make the Illinois Plan work.
These are excellent presentations - presenters are very well versed and energetic - great programs - keep up the good work.
A good day.
Keep it up.
Good conference
Please advise ALL participants of the ITEA "Technology Teacher" and other benefits of becoming professionally involved with the ITEA. We should all realize the benefits of membership. Illinois is not the only leader in how Tech Education is being handled.
The ideas and materials are GREAT, but my department budget is too small to obtain the needed equipment. That is the main obstacle.
Very good
But please conduct all day sessions! 1/2 day is not enough to cover so much.
Seemed useful for middle school and entry level Tech courses - less useful for AVC level.
This workshop should most definitely be a day long - there is just too much data to learn in 4 hours.
Get more teacher involvement in the program presentations. Lets see what more instructors are doing in their class.
Information on how to start up programs. Examples of pieces and the different types of materials offered, not just catalogs.
Establish a published listing of schools with Illinois Plan and contact persons.
Good program today
Please have more for Commercial Art and Video Production, Computer, and Animation Airbrushing
More indepth coverage of communications other than computer oriented. There are still other traditional communication methods which could be covered....also more demonstration by instructors in the areas

Additional information needs to be developed in skill level programs for dissemination
More hands on demonstrations and ideas
Very good workshop
Mr. Gailo has done more for us in the past 2 years than anyone had ever before. (Inservice and new concepts, etc.)
It was a good workshop
Well organized, information readily available, everyone involved with the workshop did very well. Very professional
Enjoyed the day and the "hands on"
Teachers should bring exhibition of innovations they use that others may be interested in - all 4 areas- demos, homemade equipment, experiments, etc.
Good job

ENERGY UTILIZATION TECHNOLOGY
WORKSHOP EVALUATION SUMMARY
FY 91

Directions: Read the following directions carefully. Respond to each statement by circling either strongly agree (SA), agree (A), undecided (U), disagree (D), strongly disagree (SD).

1. The learning activities presented during the **Energy Utilization Technology Resource** session were good enough for me to try with my students.

SA	A	U	D	SD
56%	44%			

2. The content and activities (e.g., teacher discussion, vender equipment, curriculum material and resources) presented during the **Energy Utilization Technology Resource** session can be used to help teach students about the concepts of Energy Utilization Technology (e.g., passive solar, active solar, wind, hydroelectric).

SA	A	U	D	SD
46%	51%	3%		

3. The learning activities presented during the **Teaching Energy Utilization Technology Through Hands-on Activity** session were good enough for me to try with my students.

SA	A	U	D	SD
54%	42%	3%		

4. The learning activities presented during the **Teaching Energy Utilization Technology Through Hands-on Activity** session will help students learn about and reinforce concepts like storage, collection, absorption, passive and active energy, energy conversion, and thermal mass.

SA	A	U	D	SD
59%	39%	2%		

Directions: Read the following statements carefully. Respond to each statement by circling the letter F if you felt the session was poor, the letter D if you felt the session was below average, the letter C if you felt the session was average, the letter B if the session was above average, or the letter A if the session was excellent.

5. What is your evaluation of the **Energy Utilization Technology Resource** session?

Poor	Below Average	Average	Above Average	Excellent
F	D	C	B	A
	2%	16%	50%	32%

6. What is your evaluation of the **Teaching Energy Utilization Technology Through Hands-on Activity** session?

Poor	Below Average	Average	Above Average	Excellent
F	D	C	B	A
		25%	36%	39%

7. What is your overall evaluation of the Energy Utilization Technology workshop?

Poor	Below Average	Average	Above Average	Excellent
F	D	C	B	A
	1%	16%	46%	37%

Directions: Read each statement carefully. Circle the letter of the **ONE** item that best reflects your feelings. Please indicate any comments you would like to make.

8. Which of the following statements best describes your position?

13% A. I teach junior high
40% B. I teach 9th and 10th grade
40% C. I teach 11th and 12h grade
2% D. I am a vocational administrator or director.
E. I am a school principal.
F. I am a school superintendent.
4% G. Other
Electronics and Coop
Student Teacher

9. When did you last attend an Illinois Plan for Industrial Technology Education workshop?

14% A. I have never attended an Illinois Plan workshop.
46% B. Communication Technology workshop last fall.
36% C. Last year.
2% D. Two years ago.
2% E. Three years ago.
F. Longer than four years.

Comment:
Very Good
Keep them up
Production, Tele Conference
Construction, Production, Transportation
Manufacturing workshop
Good!
This workshop was not as informative as the other workshops - it could be because there is not that much material available.
I have found these workshops to be very useful - especially the hands-on stuff.
New to the state.
Good
I am new to teaching Tech Ed.
Have found these workshops to be very useful-especially the hands-on stuff.

New to the state.
Good
I have never failed to find something I can use in my classroom at these workshops.

10. Are you currently teaching any courses related to technology or industrial technology education?

89% A. Yes
11% B. No

Comment:
Some activities in my general Industrial Arts classes
Energy
4 areas of Illinois Plan
Phasing into it gently, have taught production
Starting to introduce
Production Tech, Energy Con Tech, Comm Tech, Trans Tech
Communications - limited
I have never failed to find something I can use in my classroom at these workshops.

If you answered yes to question #10, then please answer the following question.

11. Which of the following areas best describes the types of technology courses you teach?

A. Communication Utilization Technology 18
B. Energy Utilization Technology 13
C. Production Technology 22
D. Transportation Technology 20

Comment:
All areas - Thanks to State Board of Ed requirements for high school courses. I hope all of the college students anc work in the industry.
Technical graphics
Combination of all four
Very good
Drafting
CAD-Robotics
Semester long
2 each year (every other year)
All of the above nine week courses
Orientation level
I teach all four semester courses
All the above - currently in the process of converting from traditional methods toward newer.
Stuck in tradition. (not my choice)
Need updated more economical practical lab projects

Wood/welding by a different name
Single teacher
Communication Technology
All Three

CO2 cars
Soda bottle rockets
Car builder
Paper cars
Boat Building
CO2 cars
All of the above.
Very informative
Electronic and Advance Electronics Coop
We cover energy in our electronics sequence.

12. Which of the following statements best describes the numbers of years you have been teaching?

11%	A.	0-5 years	5
7%	B.	6-10 years	2
16%	C.	11-15 years	6
22%	D.	16-20 years	2
28%	E.	21-25 years	13
10%	F.	26-30 years	2
6%	G.	more than 30 years	3

13. Would you like to see other workshops developed in the future for the content areas associated with the Illinois Plan for Industrial Technology Education?

99%	A.	Yes	35
1%	B.	No	

If you answered yes to question #13, please answer the following question.

14. Which of the following areas would you like most to see a workshop developed for?

25%	A.	Communications Utilization Technology	8
15%	B.	Energy Utilization Technology	3
26%	C.	Production Technology	12
27%	D.	Transportation Technology	10
7%	E.	Other :	

All
All areas
Like to be updated
Less costly ways to present concepts
Updating material
This is the only one I failed to attend
TV and radio production units
Manufacturing Tech Construction
Continuation, reinforcement and new ideas in each area repeated every 2-3 years
Last Comm Tech workshop, there were too few chances for hands-on.
I would like to see a workshop where instructors get together and share what they are doing.
Break each area down further.

Technology Education
Communication
New developments
For Junicr and Senior levels
Manufacturing
All
Any area
Continuations of all presentations of exemplary teachers
Middle schools IPITE presentations
In a couple of years a workshop upgrading each of the above areas
Inter-discipline course (Math and Tech)
More of all
Always open for new ideas that could be used in our programs
An update session in a year or so in all four areas
CNC application and computers
Need real hands-on - not show and tell
Adv studies - hands-on
I would like to see more transportation activities
All of the above
Ongoing
The last communication technology workshop gave me many great ideas for my classes.
More hands-on activity
More hands-on activity along with current ones.

15. Are you currently receiving the **Technology News Today** (TNT) newsletter?

81%	A.	Yes	29
19%	B.	No	6

If you answered yes to question #15, please answer the following question.

16. Do you feel the TNT should be continued in the future?

97%	A.	Yes	27
3%	B.	No	1

Comments:
Could definitely be continued
Expand it
Excellent reference
Seems to have some good information (for me) sometimes.
Very good information and I like the activities.
Could definitely be continued.

17. Further comments:

Keep it up.
All of these workshops have been excellent in giving teachers ideas and concepts to apply.

The best program yet. Super!
Need to continue workshops to keep up to date.
Hands-on activities are great.
Help.
This was excellent with quality alternatives to high cost manufactured products.
This was the best of the four workshops.
This was the most refined hands-on of the four.
Excellent communication tool - look forward to it
We need such a publication to keep us informed!
better maps to got to workshop from greater distance
These are very good. Keep it up.
More hands-on suggestions to use rather than "Science-Lab" types.
I need these workshops.
Start earlier and dismiss earlier in the afternoon.
Could we have a summer workshop to build some of these teaching aides. It sure would help!
Did not see anything new from last workshop (several years) on Energy
I think it would be interesting to make a workshop more of a tour of several schools in operation using the II Plan. Areas I would like to see is Transportation and Energy Utilization.
Continue to offer updated workshops on the Illinois Plan
This concludes orientation series
Will workshops be developed for skill level areas
Info distributed on sources for things like meters, sizes, etc.
I enjoyed the workshop and I would like the TNT news sent to Westville High School.
Thanks for all the new input.
Have introductory charts and graphs hand outs so participants do not have to hurriedly copy them and miss most of commenting, also have available before presentation blank space to write notes.
Pick up some more projects to use. Good job.
More examples - a semester worth with time frame designated.
I hope we continue to update these workshops.
Workshops should be more specialized rather than overview, i.e. radio, video, hydraulics etc, rather than communication and energy.
Set up a system like VOAG service to send out/rent etc. kits
Both workshops that I have attended this year were professionally done and well appreciated. We need to continue to update and meet to share ideas.
Excellent workshop.
Thank you for braving the belated inclement weather to bring your materials to us in the Rockford area.
I barely get enough $ to teach in my system.
In future workshops, have teachers bring to the workshop with them projects, plans, and units of things they use to share with others. Hands-on type format. Maybe the length could be 2-4 days in the summertime.
When is Technology Ed going to become a core course and not an elective. books are fine hands-on. Problem solving is what makes a stable strong country with workers instead of users.
Workshops that I have attended this year were professionally done and well appreciated. We need to continue to update and meet to share ideas
Excellent workshop

In future workshops, have teachers bring to the workshop with them projects, plans, and units of things they use to share with others. Hands-on type format. Maybe the length could be 2-4 days in the summertime.
Excellent program.

APPENDIX B

External Evaluation

Illinois Plan for
Industrial Technology Education

Third Party Evaluation of Orientation Level Program

by

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with contributions by

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James L. Barnes
John Iley
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October 29, 1990

Applied Expertise Associates
338 Crown Point, Columbia, MO 65203

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Executive Summary

This report summarizes a third-party evaluation of the Illinois Plan for Industrial Technology Education (IPITE) conducted by Applied Expertise Associates during the Spring - Fall 1990 period. The project was specifically designed to secure the pulse of the profession and a valid measure of the degree of implementation of the IPITE in Illinois. One of the key principles guiding the evaluation was that ***impact*** is best assessed in terms of changes in practice rather than by indirect measures of attitudes, awareness, or preferences. This focus was consciously maintained throughout the study.

The evaluation's primary activities involved an analysis of IPITE documentation and a series of extensive and structured telephone interviews of three samples of Illinois industrial education teachers. A random sample and two purposeful samples (leaders and conservatives) were used to secure a representative cross section of practice and opinion. The focus was on teachers delivering orientation level ITE courses. Instrumentation, based on a validated, critical incident interview instrument, was specifically designed to identify movement along 6 dimensions of change. These dimensions were selected through a collaborative process which involved input from key individuals involved in the IPITE development and implementation process and from the TPE's experience with similar evaluations. The key dimensions of change were: (a) programmatic change; (b) methodological change; (c) facility change; (d) externally oriented change; (e) professional development; and (f) enrollment patterns.

The findings indicate that, while there is general and widespread awareness of the IPITE, only about a third of the teachers had made significant progress. Few teachers were found to be fully adopting and implementing the plan in their classes. Some considerable confusion remains over the new directions which the field is, or should be, taking. At the same time, only a relatively small percentage of teachers were found to be actively resisting the changes in the field. Similarly positive is the conclusions that there was a readily identifiable group of teachers moving ITE's implementation forward and that they were statistically and logically different than the conservative and the random samples.

The report concludes with some specific and prescriptive recommendations which are designed to build on the substantial and excellent implementation base which has been developed over the past decade. Specifically, there is a need for an increase in the level of sophistication in the orientation level's activities. Also a broadening of the base of leadership for the implementation thrust into a leadership coalition including ITE's organizations, DAVTE, and all university technology programs is called for. Successful future implementation efforts will hinge to a considerable degree on the ability of this coalition to develop an increased sense of ownership across the profession and a joint program of action.

Project Overview

This report describes a third-party evaluation of the Illinois Plan for Industrial Technology Education's (IPITE)[1] orientation-level programs. The intent was to secure the pulse of the profession to ascertain its perspectives and progress. Central to the project was the question "To what extent had the Illinois Plan for Industrial Education been implemented?" The project was conducted, during the Spring to Fall 1990 period, by ***Applied Expertise Associates*** the third party evaluator (TPE).

A critical incident-based telephone interview was used with purposeful and random samples of industrial education teachers from Illinois. Also used were in-person interviews of key leaders, and a review of IP documents. In addition, a comparison was made of the IP materials to those of selected other states. The input from these procedures was compiled into the report that follows.

Project Context[2]

In the early 1980s, the Illinois State Board of Education, Department of Adult Vocational And Technical Education funded a comprehensive study of industrial education and the development of a new State Curriculum Guide for Industrial Education. Advisory committees composed of representatives from business, industry, and education were formed. After two years of gathering information, developing conceptual models, reviewing literature, reacting to ideas, and revising a curriculum framework, the Illinois Plan for Industrial Technology Education evolved. Its mission was to develop a model curriculum for industrial education that would address the needs of students preparing for life and work in the Twenty-first Century.

In 1981, the project's primary objective was to develop four curriculum guides in the areas of Communication Technology, Energy Utilization Technology, Production Technology, and Transportation Technology. These courses were further developed by piloting them in four public schools the following year. In 1984, the curriculum guides were printed and disseminated throughout the state during 68 teacher inservice workshops and university-sponsored graduate courses.

To help teachers make the transition from a traditional industrial arts curriculum to a technology-based curriculum, 44 hands-on workshops were conducted throughout the state during the 1985-1986 and 1986-1987 school years. During the workshop, teachers

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[1]Also referred to as the Illinois Plan (IP)

[2]A historical retrospective supplied by Illinois Plan staff.

were provided additional curriculum materials and opportunities to experiment with technology-based learning activities and preview microcomputer software. To recognize exemplary programs and to disseminate information, the project began publishing the *Technology News Today* newsletter in 1985. In addition, project staff produced a learning activities packet and 10 detailed exploration units that could be implemented at the orientation level (grades 9 and 10).

Subsequently, many teachers used the curriculum materials developed by the project to update their traditional industrial education courses and move toward a technology-based curriculum. Meanwhile, technology continued to evolve and many teachers offered curricular suggestions that needed to be shared with the rest of the profession. Therefore, in 1987, it became apparent that the orientation level curriculum guides produced in 1984 needed to be revised. In 1988, ISBE/DAVTE personnel, project staff, and a cadre of industrial technology teachers evaluated the 1984 guides and provided input for revising them. A revised orientation curriculum guide was developed in 1988. The revised guide and a new learning activities packet was disseminated throughout the state during 24 hands-on inservice workshops in 1989.

A significant amount of time, financial, and human resources have been dedicated to the development, dissemination, and promotion of a technology-based curriculum designed to help classroom teachers serve the technological literacy needs of young people. Given the project's maturity, it is appropriate to evaluate the impact of this curriculum initiative on the status of industrial/technology education in Illinois. **The primary purposes of the evaluation are to help fulfill the project's internal and external accountability needs and to provide direction for future curriculum development and teacher inservice activities.**

Purpose

The key purpose of this project was to conduct a third party evaluation of the impact of the orientation level activity of the Illinois Plan for Industrial Technology Education Project and by doing so, establish a credible sense of the pulse of the profession. A secondary purpose was to develop a general comparison of the Illinois Plan's orientation level materials to those of selected programs in other states. To address these purposes, several research questions served to target the evaluation:

1. What are the attitudes of Illinois ITE teachers towards the IPITE and its orientation level materials?
2. To what extent have Illinois ITE teachers implemented the IPITE orientation level materials and what is the nature of that implementation?

3. What are the demographic characteristics of IPITE teachers and how do they relate to research questions 1 and 2?
4. How does the IPITE project and its orientation level materials compare to those of selected other states?

Evaluation Design & Instrumentation

The IP leadership approached the challenge of reviewing their curriculum project with the realization that an internal assessment would be prone to bias and other problems. They then decided to involve an outside evaluator, yet one experienced in the field of change in technology education. This lead to their contracting with **AEA**.

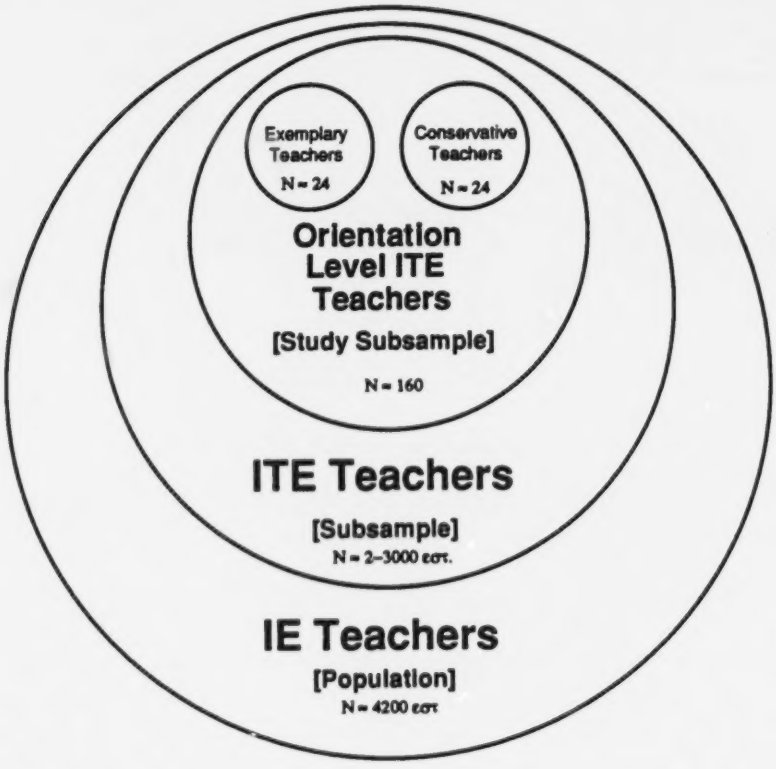
Given the goals of the project, it was jointly decided between **AEA** and Illinois principals, that a mailed survey would not yield the depth of qualitative information desired. Furthermore, a pretest-posttest design was not feasible since benchmarks had not been established at the project's beginning. A review of the feasible alternatives suggested that in person interviews and on-site visits would be most likely to generate the desired information. Fiscal constraints however intervened to make this approach unworkable. Consequently, and with IPITE project staff encouragement, the evaluators turned to telephone interviews for data collection.

The population and sample

The study's population consisted of all Illinois teachers involved in teaching industrial education. Within this large group, the project focused on the sample which was involved with ITE, and within that group, a further subsample of teachers involved in delivering orientation level ITE. The TPEs also asked the IPITE project and state department staff to provide calibration samples of 24 exemplary/innovative IP teachers and also 24 conservative teachers. These were seamlessly incorporated into the overall sample so that any individual's classification was kept from the interviewers.

The Illinois State department of education was enlisted to identify the entire population of IE teachers in the state [N estimated at 4200]. Analysis of the state data files ascertained that it would not be possible to know exactly what specific subjects any given teacher taught. This meant that it was impossible for the researcher to use state information to directly identify the subsample desired for the project, namely those teaching orientation level ITE. Consequently, a DAVTE consultant developed a letter which was sent to a random sample of Illinois IE teachers believed to teach ITE based

Figure 1. Population and samples



on their primary CIP Code[1] designation in the state's database. The letter invited recipients to participate in a telephone interview. With this letter was a response card (provided in Appendix A) to indicate the respondent's willingness to participate, their involvement with orientation level ITE and their home phone number, as well as convenient access time envelopes.

Instrumentation

The interview instrument posed a significant problem. To get a sense of where professionals are on an adoption continuum is a non-trivial challenge -- particularly with a profession as encompassing and potentially diverse as industrial technology. Extensive discussion with the Illinois project leaders resulted in the identification of key indicators of change important to them. These indicators could be viewed as litmus tests that confirm a move towards a technology-based curriculum from the industrial

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[1] *Classification of instructional programs*, US Department of Education

arts position. A review of the practice of gauging change revealed similar characteristics. Provided in detail in Appendix B, these indicators formed the core of the interview questions. Their major categories were:

1. Programmatic Change [What is taught in ITE]
2. Methodological Change [How ITE is taught]
3. Facility Change [Where ITE occurs]
4. Externally oriented change [How ITE is presented to "significant others"]
5. Professional development [What the educator does about his/her own capabilities in ITE]
6. Enrollment [Cumulative effect]

Then, the problem became how one incorporates these dimensions into an interview instrument. A variety of formats were considered, including Likert, Thurstone, Semantic Differential and Q-Sort. All were deemed unwieldy given the financial constraint of keeping the telephone interview to approximately 15 minutes. Furthermore, each posed significant problems because of their closed nature, i.e., that they were more suited to identifying a situation with one clearly definable right answer. Certainly, quality ITE programming has, if anything, multiple acceptable approaches that each could represent satisfactory implementation. As evidence of this, note the diversity of technology education implementations around the nation.

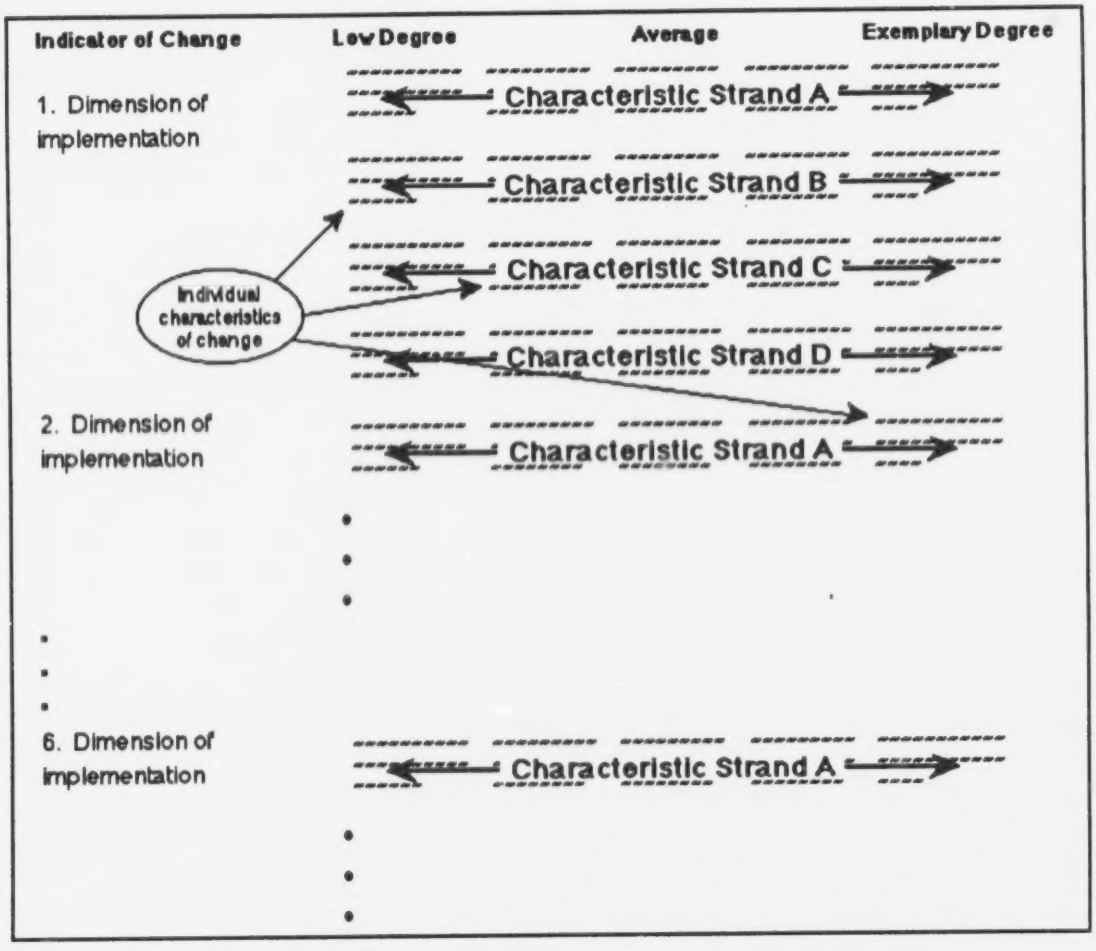
The TPE's experience then lead to a methodology used originally to identify and classify complex behaviors along a continuum. Known as the critical incident scale, it works by first describing characteristics of degrees of behavior along a graphic continuum. Then, the observer watches to note which of the characteristics best match with an observee's behavior. This match positions the observee at a discrete point along the measurement continuum. An example is provided in Figure 2. Because of the use of specific (or equivalent) incidents to describe positions on a continuous scale, it was decided that the resulting data could be considered interval level.

Figure 2. Example of critical incident scale

Behavior Characteristic	Dangerous		Average		Exemplary
Student safety consciousness	Chases, with sharp tool in hand, after other students in lab	Regularly needs to be reminded about safety rules	Occasionally needs to be reminded about safety rules	Almost always follows personal safety rules	Always works according to safety rules and guards against others getting hurt as well

This critical incident approach was specially adapted for use with telephone interviews. For this, it was modified by the researcher to include a greater number of indicator strands for each overall assessment. Figure 3 shows the concept of this modification. In addition, one further rating dimension, over the six originally established, was added per input from IP project staff. This addition involved an overall judgement, by the interviewer, as to where in the affective domain's hierarchy (Krathwohl et al.[1]) the interviewee best placed. This hierarchy ranges from receiving through responding, valuing organization, to characterization.

Figure 3. Modification of critical incident approach



[1]Krathwohl, D.R., Bloom, B.S. & Masia, B. A. (1964). *A taxonomy of educational objectives: Handbook II, the affective domain.* New York: David MacKay Co.

The result of this interaction was the instrument shown in the first half of Appendix C. Readers will note that in addition to the critical incident scales, a general set of demographic data was collected by using the instrument's front section, as were some open-ended qualitative/impressionistic responses about key issues of the project. The latter included:

1. Extent of knowledge of the Illinois ITE Plan, the new guides, *TNT*, workshops, conferences, graduate courses:
2. Attitude towards the IPITE materials (if respondent has seen them)
3. To what extent have you used the IPITE orientation level materials:
4. What have you done with them?
5. How good are they?
6. Were the activities useful?
7. What value is the TNT periodical newsletter?
8. What are the barriers to progress (towards further implementation of TE) as you see them?
9. What has been the most helpful thing to you in enhancing the quality of your program?

This instrument then was piloted in order to assure its workability. This activity involved identification of approximately ten teachers from each of these states: Missouri, Michigan and Kansas. The researcher and two colleagues (identified in Appendix D), all seasoned ITE professionals with experience in both traditional and innovative programs, then used the pilot version of the instrument to rate the teachers. Several of these interviews were conducted on a conference call basis pairing interviewers so that some standard of comparability was developed. The experiences and assessments then were reviewed, first by the project director and then jointly by a conference call of the interviewers. A series of revisions were then made to the instrument and procedure. These included primarily the addition of further critical incidents in the various strands.

Interviews were randomly, and blindly with respect to subsample classification, assigned to the various interviewers (identified in Appendix D), who then proceeded to call. Given the time constraints, a fifth interviewer was added to the team at this point. The resultant distribution of interview numbers is shown in Table 1.

The actual interview procedure involved establishing credibility over the telephone by first explaining the purpose of the survey, indicating the third-party nature of the evaluation and communicating an assurance of confidentiality. It was also made clear

to the surveyed teachers that the interviewers were "one of them", i.e., that they were involved in teaching ITE as well. Then the demographic and open-ended questions were asked, followed by the questions for assessing the dimensions of change. Generally it was attempted to keep the interviews to 15-20 minutes but many went over this target. Most respondents were reached at home.

Table 1. Interviewer assignment distribution

	INTERVIEWS CONDUCTED			
Interviewers	Leaders	Conservatives	Random Samples	Total
Barnes	2	1	24	27
Boyt	5	2	12	19
Custer	2	1	16	19
Dyrenfurth	4	6	39	49
Iley	2	3	9	14
Total	15	13	100	128

The interview process involved recording the key points of each interviewee's responses and observations on individual survey instruments. Both direct responses to questions and comments, as well as key impressions needed to characterize the interviewee's position with respect to the demographic and front-end questions were recorded. The establishment of each dimension of change rating involved a different procedure. First, the dimension being rated (one of the six identified on page 5) was clearly established in the interviewee's mind. Then, interaction on the various strands established which critical incidents, i.e., descriptions best fitted the interviewee and his/her situation. This was recorded by circling the fitting critical incidents and, where appropriate, by writing in additional comments on the survey form. Subsequently, the interviewer made an overall judgment about where the interviewee placed on the continuum from active resister to true leader. This was indicated by marking a bold vertical line (across the column headings at the top of the page) at the point that best designated the interviewee's placement. The center of each column was coded as an integer with active resister=1 and true leader=6. Interviewers were encouraged to use increments of .25 in marking each dimension's overall judgment.

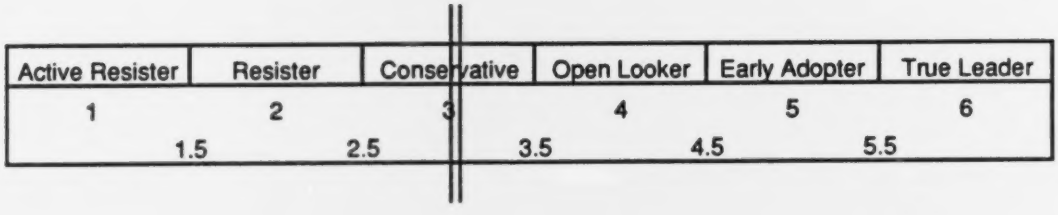


Table 2 presents the data calculated to investigate the results of interviewer training with respect to the comparability of their ratings. These data were subsequently tested using a statistics program (Macintosh-based) called StatView 512+. Because it was judged that the necessary data conditions had been satisfied, a single factor analysis of variance was conducted to ascertain the existence of significant differences ($p < .05$) among interviewers if they existed. The results of this analysis are presented in at the bottom of Table 1. The F ratio was significant indicating that there were differences among the interviewers. Post-hoc analyses (documented in Appendix E) revealed that they were caused primarily by one of the five interviewers. A further ANOVA was run with this interviewer's results removed from the database. This time the F ratio was not significant. To be certain, post hoc analyses were again run, but this time they did not reveal any significant differences among the interviewers.

For purposes of rigor, and given the unusual cell sizes, a SAS GLM (General Linear Model) procedure was also used to replicate the StatView ANOVA. The SAS results were not substantially different from those calculated by StatView. Similarly, to test the criticality of the data level assumptions, another analysis was run using a Kruskal-Wallis test. This was done should the position be taken that the critical incident scale only yielded ordinal data. This nonparametric analysis also revealed results essentially similar to those of the ANOVA's. These analyses suggested that the issues revolving around reliability had been resolved sufficiently to have confidence in the results. It should also be noted that in the findings section, this report's critical statistical tests for group and other differences did not use the outlier interviewer's data.

Other data collection

Yet another set of data collection procedure involved the review of a number of key documents that described the IP's evolution and progress. These included relevant Illinois State Board of Education, Illinois Vocational Curriculum Dissemination Center, Illinois Vocational Resource Center and Illinois Plan project documents. Examples were: Annual project reports and documentation, newsletters, key meeting minutes, workshop evaluations, and selected reports from FY81 to FY89. Among the information contained in these documents were the project's objectives, its curriculum development activities, inservice and dissemination activities, selected internal evaluation data and samples of the curriculum products.

Subsequent work involved a light comparative content analysis of Illinois Orientation to Industrial Technology guides and materials comparing them to materials from other states and to the third party evaluator's sense of the profession's direction. Reference was also be made to national curriculum thrusts for context.

Table 2. Inter-interviewer reliability

		Inter-interviewer reliability (R1-R6 mean) (mean/standard deviation/N)				
Samples		Barnes	Boyt	Custer	Dyrenfurth	Iley
1. Leaders	$\overline{X}$	**5.79**	**4.72**	**5.21**	**4.64**	**6.00**
	SD	0.12	0.65	0.41	1.05	0.35
	N	2	5	2	4	2
2. Conservatives	$\overline{X}$	**2.63**	**3.96**	**1.54**	**3.22**	**3.10**
	SD	-.-	-.-	-.-	0.82	0.91
	N	1	1	1	6	2
3. Random	$\overline{X}$	**3.26**	**4.30**	**3.33**	**3.38**	**4.12**
	SD	1.34	0.84	1.18	0.90	1.31
	N	24	10	15	35	7
4. All Combined	$\overline{X}$	**3.42**	**4.41**	**3.43**	**3.47**	**4.28**
	SD	1.62	0.99	1.52	1.18	1.48
	N	27	16	18	45	11

One Factor ANOVA X_1: Interviewer Y_1: R1-R6 Means

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	4	17.262	4.316	3.175
Within groups	112	152.214	1.359	p = .0164
Total	116	169.477		

Model II estimate of between component variance = .739

Integral to the entire evaluation project were interviews and discussions of the project with IPITE project personnel and Illinois State Board of Education research and consultant specialists. This began with several meetings to discuss the purpose, scope, key questions, stakeholders, audiences, information sources, data collection procedures, timeline, and financial resources for the proposed evaluation. Participants in these meetings included Jerry OHare, Franzie Loepp, Ken Welty and Emerson Wiens.

Findings

The findings are presented with respondent demographics first. These are then followed by a descriptive summary of their reports about the practice of their profession and their comments about the IPITE. Table 3 depicts the overall population estimates, the sampling plan and responses.

Table 3. Respondent numbers and percentages

Illinois Population	Sample N	Responses N	Percentage	Interviewed N	Percentage of sample	Percentage of responses
IE Teachers	4200 est	158	4.9%	128	4.0%	--.--
ITE Teachers	2-3000 est	158	7.9%	128	6.4%	--.--
Orientation Level ITE Teachers	1500 est	158	10.5%	128	8.5%	--.--
Random Sample	230	130	56.5%	100	43.5%	76.9%
Exemplary ITE Teachers	24	15	62.5%	15	62.5%	100.0%
Conservative ITE Teachers	24	13	54.2%	13	54.2%	100.0%
Total	278	158	56.8%	128	46.0%	81.0%

Interviewee Demographics

The 158 respondents formed the pool of potential interviewees. Their characteristics, with respect to self-reported teaching of orientation level IPITE, and willingness are shown in Table 4. There were 5 incomplete responses.

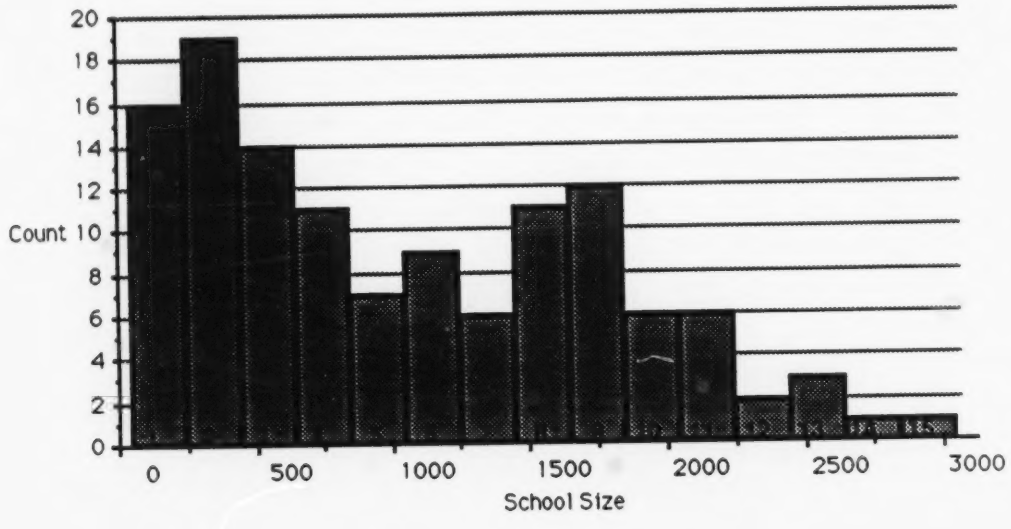
Table 4. Respondent willingness and IPITE characteristics

Teaches orientation level ITE	Willingness to participate: Yes	Willingness to participate: No
Yes	100	37
No	2	14

Of the 158 respondents, the five interviewers were able to successfully reach and interview 128 of the respondents. Of these, 97 actually reported that they taught orientation level ITE and 31 claimed that they did not. Ratings were completed for 117 respondents. The interviewed teachers were primarily (n = 103) at senior high schools but 14 were at a combination of junior and senior high school. Eleven also reported that they were teaching at a junior high/middle school.

Interviewees were asked the size of their schools in terms of student enrollment. They reported an average school size (number of students in grades 9-12) of 1043 with a standard deviation of 728.5 (n = 124, NR = 4). These data were plotted (Figure 4) to illustrate the nature of the distribution which is clearly non-normal.

Figure 4. Interviewees' school size distribution



		Interviewee Number by Sample Type			
Bar	Size Range	Leader	Conservative	Random	Combined
1	40-240	3	3	10	16
2	240-440	4	2	13	19
3	440-640	2	1	11	14
4	640-840	2	0	9	11
5	840-1040	0	0	7	7
6	1040-1240	0	0	9	9
7	1240-1440	0	1	5	6
8	1440-1640	2	3	6	11
9	1640-1840	0	1	11	12
10	1840-2040	0	0	6	6
11	2040-2240	0	0	6	6
12	2240-2440	1	0	1	2
13	2440-2640	0	0	3	3
14	2640-2840	1	0	0	1
15	2840-3040	0	0	1	1

Table 5 depicts the positions held by the 128 (116 male, 3 female, 9 non-responding) interviewees. They were professionals with predominantly classroom instruction responsibilities. Their age characteristics, provided in Table 6, confirmed the common perception that ITE is a greying profession. It was also observed that leaders averaged almost five years younger than conservatives and that the random sample averaged almost the same age as the conservative sample.

Table 5. Interviewee positions

	Teacher	Teacher/chair	Department chair	Non response	Totals
Frequency, N	83	35	5	5	128
Frequency, % of resp.	64.8%	27.3%	3.9%	3.9%	

Table 6. Interviewee age characteristics

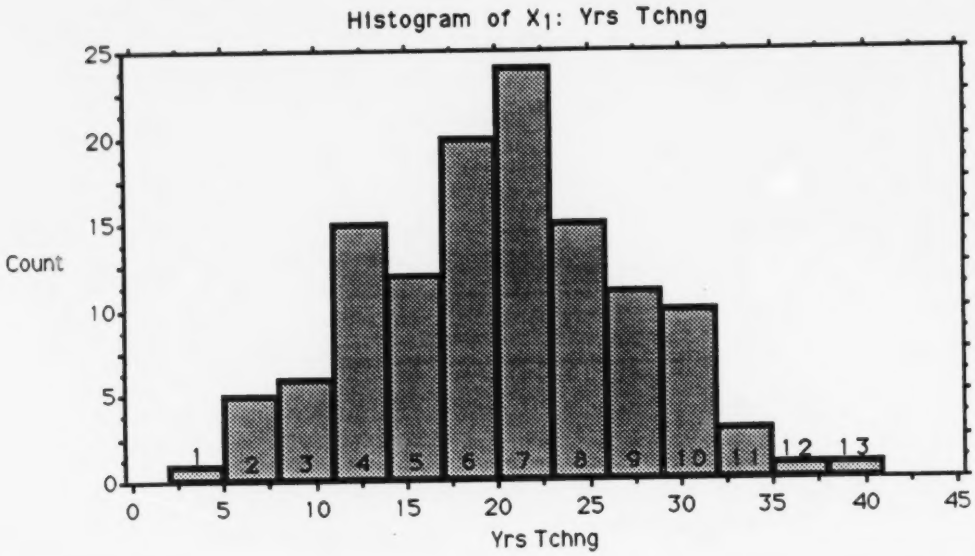
Age	Leader	Conservative	Random	Combined
$\bar{X}$	39.86	44.83	44.20	43.73
SD	5.488	7.906	7.925	7.755
N	15	13	100	128

The combined samples of interviewees' years of teaching experience are closely related to their age characteristics as shown in Table 7. This characteristic was graphed (Figure 5) to develop a sense of its distribution which resembles a normal distribution. Subsequent analysis revealed evidence of substantial differences among the distributions of the various samples as depicted in Figure 6. Overall the individual samples sequenced in increasing numbers of years of teaching experience from leader, to random to conservative. Notably, however, the distributions of the leader and conservative samples appeared grossly non-normal but the random sample appeared to approach normality. The small sample size of the former two groups is probably a major factor shaping these distributions.

Table 7. Interviewee years of teaching experience

Years Teaching	Leader	Conservative	Random	Combined
$\bar{X}$	16.85	22.00	19.827	19.7
SD	5.005	6.660	7.460	7.207
N	15	13	98	126

Figure 5. Interviewees' years of teaching experience distribution (combined samples)

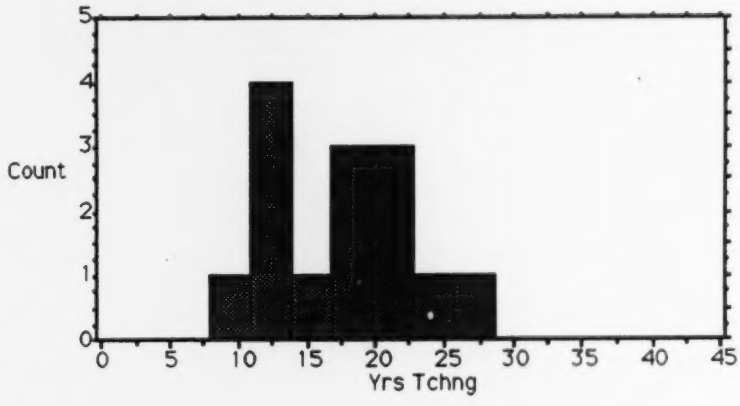


X_1: Yrs Tchng

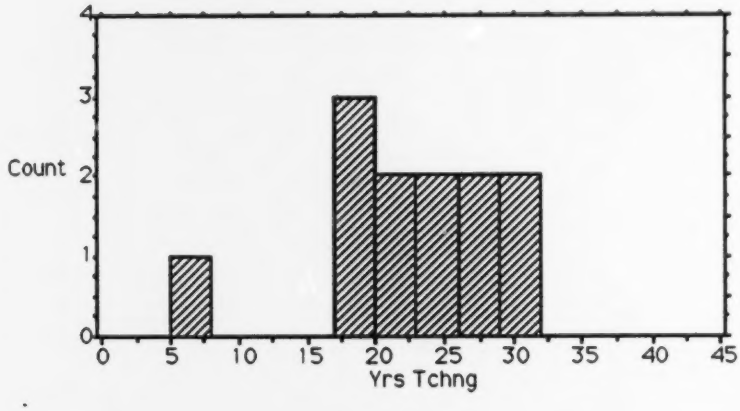
Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	2	5	1	.806	
2	5	8	5	4.032	
3	8	11	6	4.839	
4	11	14	15	12.097	
5	14	17	12	9.677	
6	17	20	20	16.129	
7	20	23	24	19.355	-Mode
8	23	26	15	12.097	
9	26	29	11	8.871	
10	29	32	10	8.065	
11	32	35	3	2.419	
12	35	38	1	.806	
13	38	41	1	.806	

Figure 6. Comparisons of teaching experience by sample type

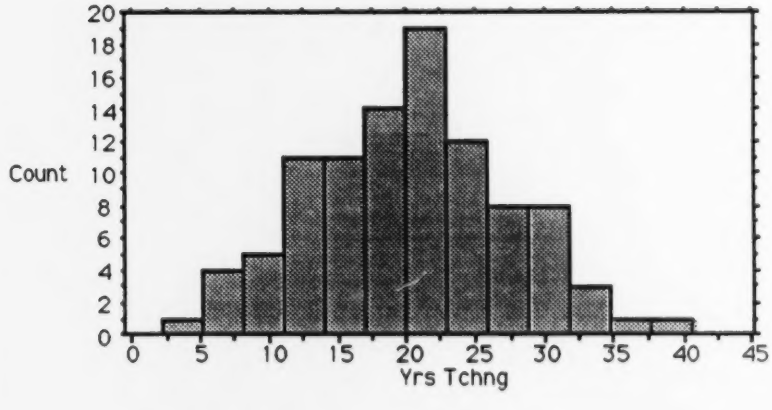
Leader sample



Conservative sample



Random sample



The interviewees reported involvement with grades from 7 through 12. As shown in Table 8, most taught courses that spanned grades 9 to 12 in terms of their enrollment. They also indicated (documented in Table 9) significant investment in their own professional education with approximately 42% holding the masters degree and 34% reporting 15 or more hours beyond this or even higher degrees.

Table 8. Grades taught by interviewees

	7-8	7-9	7-12	8-12	9	9-10	9-12	10-12	11-12	12	Non-Response	Total
Frequency, N	1	1	5	5	1	2	87	8	2	2	14	128
Frequency, %	0.8	0.8	3.9	3.9	0.8	1.6	68.0	6.3	1.6	1.6	10.9	

Table 9. Degrees reported by interviewees

Degree	Bac	Bac+	Bac++	MS	MS+	MS++	EDS	Doc	NR	Total
Frequency, N	24	2	4	54	9	16	1	1	17	128
Frequency, % of resp.	18.8	1.6	3.1	42.2	7.0	12.5	0.8	0.8	13.28	

Given the age of the interviewees, it might be questioned when they assembled their relatively high level of formal education. Although this was not asked directly, the interviews did not convey the sense that much of it occurred recently. However, the teachers contacted were asked about their most recent university course. Their reports of course names and universities are compiled in Appendix F. No pattern was evident in these responses. The majority mentioned technical and educational courses of some kind (32 and 31 respectively), non-ITE, technical or education courses (8), cooperative education (10), and ITE professional classes (6) also were mentioned frequently, as were IPITE courses (22). It might be important to note that professional ITE courses and IP of any kind constituted only 25% of those mentioned.

Findings with respect to the IP

The titles of ITE courses that interviewees reported as being taught at their schools was extensive. Presented in Appendix G, these mentions included approximately 204 different titles, 352 multiple course listings for a total of 485 course offerings. About 132 (27%) of the 485 might be construed to reflect the IP in terms of their titles. From the usage of the interviewees, it is clear that much trade and industrial education is offered in Illinois' high schools and that many teachers are not clear about the distinction between this and IPITE.

In sharp contrast, the teachers interviewed demonstrated a high degree of awareness of the IP, its materials, the new guides, TNT, workshops, conferences, and graduate courses. Table 10 may well understate the case but it should be noted that only 1.6% of the respondents had not heard of the project and that only 8.6% had heard, but not seen, some IP materials. Additional insight may be gleaned from the interviewees' comments and percentages presented in Appendix H.

Table 10. Interviewee awareness of the Illinois Plan

	A. Heard of it/them	B. Seen/ reviewed it	C. Actively using it, teaching from it	D. Not heard of it/them	Non-Resp.	Total
Frequency, N	11	61	45	2	9	128
Frequency, % of resp.	8.6%	47.7%	35.2%	1.6%	7.0%	

Each interviewee was also asked, provided they indicated at least minimal familiarity with the IP materials, some open ended questions probing their attitude towards these materials. Typically very little stimulus was needed to get the respondent talking. Most volunteered information that made categorization of their attitude relatively easy. Table 11 summarizes the attitudes voiced by the interviewees and Appendix I presents detailed responses.

Table 11. Attitude towards the IPITE materials (if respondent has seen them)

	A. Very positive	B. Some what positive	C. Neutral	D. Some what negative	E. Very negative	Non-Resp.	Total
Frequency, N	31	25	35	17	16	4	128
Frequency, % of resp.	24.2%	19.5%	27.3%	13.3%	12.5%	3.1%	

One of the project's objectives was to learn of the extent of participation in the IPITE workshops and courses. Accordingly, interviewees were asked when they last attended an IPITE workshop and how many they had experienced during the last three years. Tables 12 and 13 present a summary of the responses.

Table 12. Dates of most recent IPITE workshop attendance

	This year	Last year	More than 2 years ago	Never	Non-Response
Frequency, N	16	46	45	10	11
Frequency, % of resp.	12.5%	35.9%	35.2%	7.8%	8.6%

Table 13. Number of IPITE workshops attended in last three years

	0	1	2	2 or 3	3	3 or 4	4	5 or 6	6	6 or 7	Over 7
Frequency, N	21	20	31	2	16	5	8	4	2	3	9
Frequency, % of resp.	16.4	15.6	24.2	1.6	12.5	3.9	6.25	3.1	1.6	2.3	7.0

Interviewees were also asked a series of questions about their orientation level IPITE courses. The first sought to establish how; i.e., what subject matter focus was used for the respondent's orientation course; the site approached orientation to ITE. Appendix J summarizes these responses using the IP's five primary options. Thirty seven mentions were made of a comprehensive overview course but by far the majority spoke of an approach using a single system of technology as a focus. This included 40 mentions of communications, 28 of energy utilization, 28 of transportation, and 31 of production.

Probing further, the researchers had the interviewees commit to estimating the percentage that IPITE materials comprise of their course. This is summarized in Table 14. Given the variability of responses however, the reader is well advised to also review Appendix K's detailing of comments associated with this rating. Notably, very few (13%) respondents stated that they used the materials "Extensively" or, conversely, "Not at all" (15.6%).

Table 14. Extent of IPITE orientation level material use.

	Extensively	Some	Not at all	Non-response
Frequency, N	17	72	20	19
Frequency, % of resp.	13.3%	56.3%	15.6%	14.8%

Subsequently, the interviewees were asked how they used the materials. The overwhelming majority mentioned using them to help prepare course activities and curriculum. Very few made accreditation, evaluation or public relations uses of these materials as can be seen in Table 15. Note that percentages could not be appropriately calculated because participants were encouraged to mention all the uses that came to mind. Appendix L provides further details of participant comments and perceptions about the nature of their use of IPITE materials.

Table 15. Uses made of the IPITE materials

	A. Help prepare curricula / student activities	B. Help meet state requir'mnts	C. Run a better program	D. Help parents learn about program	E. Prepare for North Central, state or other evaluation	F. Help get better funding (state or local)	G. Help adminis-trators learn about program	H. Access instruc-tional resources	Non-resp.
Frequency, N (respondents could identify more than one choice)	76	23	28	13	11	11	20	28	51

Following this, the interviewees were asked to render a judgement about how good the IPITE curriculum materials were and whether the activities they contained were useful. Appendix M presents the comments recorded in response to this question. An approximate categorization of the comments yields 34 assessing the materials as less than positive and some 26 as good or better. More valuable than their actual count, is the nature of the comments. There was a significant volume of comments positive in nature. However, the interviewers were also impressed by the frequency with which the materials were referred to as "rinky-dink" or "juvenile". Clearly, Illinois high school teachers have ingrained standards of sophistication or "technological depth" that were not met by the materials. Therefore, many teachers viewed the IPITE materials as more suitable for the junior high/middle school. Importantly, several respondents did point out that the recent updates and supplements were moving in the right direction.

Of all the IPITE materials, the *TNT Newsletter* was certainly the most favorably reviewed of the IPITE materials is documented in Appendix N. Almost all respondents (except 14, about 10%) indicated receiving it and most had positive things to say about it. For example, mention was often made of the value of the activity and the software review sections.

Just prior to beginning the critical incident rating of dimensions of change, the participants were asked to identify both the most significant barriers keeping them from progressing and also the most helpful things they had experienced. Appendices O and

P respectively present the recorded comments. On the negative side most of the traditional barriers were mentioned. Lack of administrative support; money for equipment and other needs; low status; counselors and above all the newly raised high school graduation requirements and college entrance requirements were all frequent complaints. Some of the more unusual ones included: a lack of industry support; a need for teachers to learn/update more quickly; personal panic; regionalization of vocational education; and following the guide too closely. The positive side's comments also needed to be highlighted. These included the project's leadership (Loepp, Welty), its workshops and the curriculum guides. Little mention was made of the state (either the department or individuals), and no mention was made of the nation's or state's ITE associations.

Descriptive analysis of dimensions of change

The results of the critical incident interview ratings were subjected to both descriptive and statistical analysis. The former consisted of presentations of descriptive statistics as shown in Table 16. The dimensions considered to be indicators of change were:

1. Programmatic Change ..... [What is taught]
2. Methodological Change ..... [Where ITE occurs]
3. Facility Change ..... [How ITE is taught]
4. Externally oriented change ..... [How ITE is presented to "significant others"]
5. Professional development ..... [What the educator does about ITE]
6. Enrollment ..... [Cumulative effect]
7. Affective rating ..... [Overall judgement]
8. $R_{1\text{-}6}$ Average rating ..... [Calculated variable]

The ratings for each of these dimensions of change are given in Table 16 for each of the three sample groups as well as an overall composite one. Also, for documentation purposes an overall correlation matrix of all the variables in the study was prepared and it is presented in Appendix Q. In addition, a correlation matrix (Table 17) was generated to get a sense of the relationships among the six dimensions and the one overall affective rating. As might be expected, there was considerable intercorrelation. This suggests that the dimensions all point to a single overall construct. It would however be premature to consider the dimensions as <u>independent</u> measures of an overarching construct, e.g, of location with respect to implementation of ITE. The patterns in the data began to emerge when graphing the results as shown in Figure 7.

Table 16. Descriptive statistics: Dimensions of change

Dimension		Sample Group Rating (mean/standard deviation/N/standard error) Leader	Conservative	Random	Combined
1. Programmatic Change	$\overline{X}$	**5.383**	**3.159**	**3.604**	**3.791**
	SD	0.755	1.384	1.420	1.480
	N	15	11	91	117
	SE	0.195	0.417	0.149	0.137
2. Methodological Change	$\overline{X}$	**5.183**	**2.773**	**3.569**	**3.701**
	SD	0.889	1.191	1.544	1.564
	N	15	11	91	117
	SE	0.229	0.359	0.162	0.145
3. Facility Change	$\overline{X}$	**4.950**	**2.432**	**3.346**	**3.466**
	SD	1.208	1.113	1.496	1.554
	N	15	11	91	117
	SE	0.311	0.336	0.157	0.144
4. Externally oriented change	$\overline{X}$	**5.15**	**3.227**	**3.505**	**3.690**
	SD	1.034	1.052	1.298	1.362
	N	15	11	91	117
	SE	0.267	0.317	0.136	0.126
5. Professional development	$\overline{X}$	**5.233**	**3.386**	**3.486**	**3.701**
	SD	0.716	1.301	1.311	1.375
	N	15	11	91	117
	SE	0.185	0.392	0.137	0.127
6. Enrollment	$\overline{X}$	**4.550**	**3.386**	**3.473**	**3.603**
	SD	1.173	0.983	1.111	1.158
	N	15	11	91	117
	SE	0.303	0.297	0.117	0.107
7. Affective rating	$\overline{X}$	**5.267**	**3.409**	**3.909**	**4.036**
	SD	0.889	1.206	1.077	1.169
	N	15	11	91	117
	SE	0.229	0.363	0.113	0.108
8. R1-R6 Average	$\overline{X}$	**5.075**	**3.061**	**3.497**	**3.658**
	SD	0.824	0.873	1.135	1.209
	N	15	11	91	117
	SE	0.213	0.263	0.119	0.112

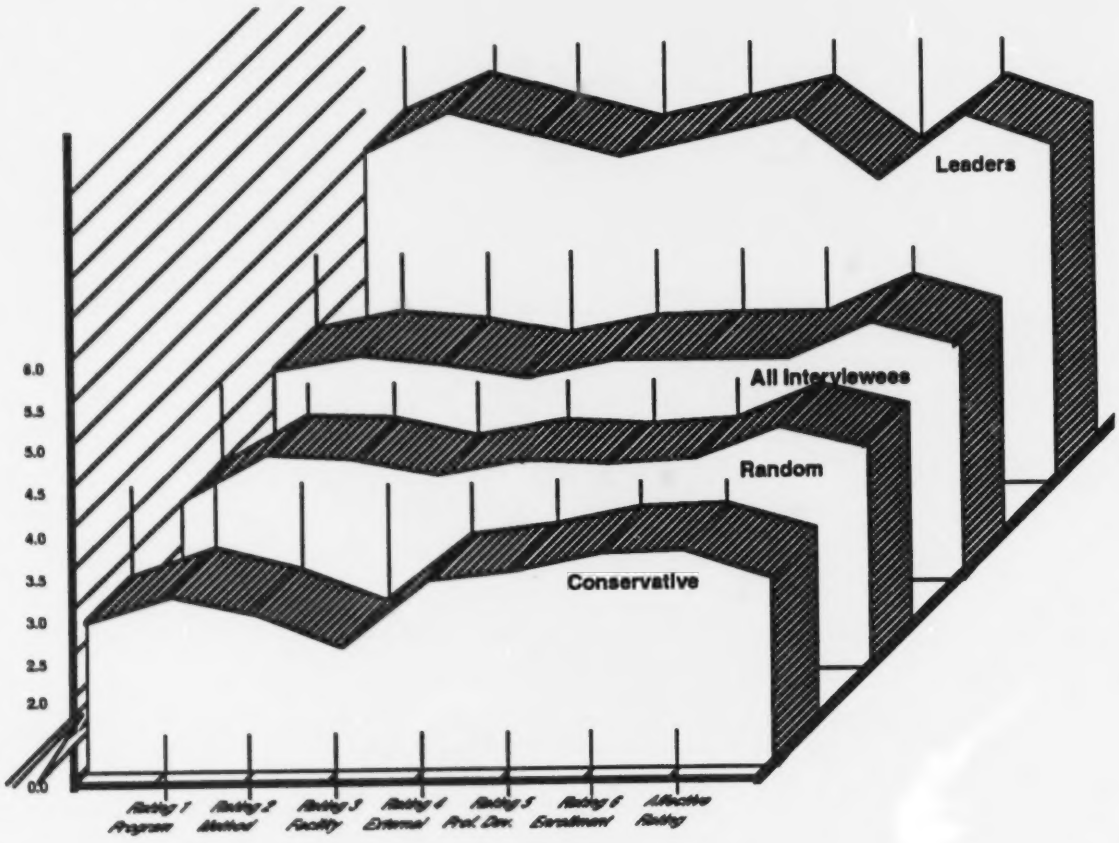
Table 17. Correlation matrix for dimensions of change ratings

Correlation Matrix for Variables: X_1 ... X_8

	R1-Prog...	R2-Meth...	R3-Facil...	R4-Exte...	R5-Prof	R6-Enroll	Affective	R1-R6 ...
R1-Progr...	1							
R2-Meth...	.877	1						
R3-Facili...	.729	.794	1					
R4-Exter...	.755	.794	.73	1				
R5-Prof	.719	.729	.666	.76	1			
R6-Enroll	.447	.49	.494	.467	.421	1		
Affective	.746	.786	.675	.762	.755	.511	1	
R1-R6 M...	.899	.931	.877	.888	.846	.63	.834	1

Note: 13 cases deleted with missing values.

Figure 7. Profiles of Illinois samples: Dimensions of change



These images need to be tempered by noting the frequency of mentions of specific critical incidents as documented in Table 18. Those incidents with a frequency of mention 25 times and over are bold-faced. Referring to the instrument in Appendix C will identify specifically which item is cited. Note that Appendix C contains two versions of this instrument. The first is presented as it was used – only with the frequency of mentions of each critical incident noted above it. The second version of the instrument lists the critical incidents in each dimension and strand in order of decreasing frequency of citation by the interviewer. In addition, listed immediately after each dimension is the set of write-in comments recorded by the interviewers. Together, the rank order-listed incident mentions and the interviewees' open-ended comments will provide the reader with a better sense of the subtleties of the interviewees' impressions of the IPITE and the nature of their implementation of it.

Dimension of change 1, Programmatic change: The most frequent mentions were: *"Has incorporated the guide's key points into curriculum"*, *"Some new materials/books"*, *"Has tried one or two activities"*, and *"Unit shop focus"*. They suggest the diversity of position within the samples as well as a relatively uncritical examination of the first incident's meaning.

Dimension 2, Methodological change: Responses focused on: *"Mixture of projects and traditional activities drawn from the craft era"*, *"Uses experiments, brain-storming, design, black box approaches"*, *"Implements guide activities "*, *"No student club or extra curricular involvement of students"*, and *"Mixture of projects activities and/or experiments drawn from industry or technology content base"*. This again reflects diversity and does not paint a convincing picture of a significant revolution in the profession's teaching methods.

Dimension 3, Facility change: Frequently cited incidents were: *"Added computers to laboratory"*, *"Some new technology equipment"*, *"No facility change"*, and *"Cleans up existing facility."* They suggest that teachers are making progress where possible and that most of this occurs in small steps rather than the complete mounting of new facilities.

Dimension 4, Externally oriented change: The only frequent citation was: *"Not considering links with other departments as feasible"*. This flies in the face of two important thrusts in education. The first is the reinforcement of, and interaction with, those building the basic skills of students. The second is the interdisciplinary character of technology education that is portrayed by its advocates.

Dimension 5, Professional development: This rating included no incident cited 25 or more times. Given that there were 35 possible incidents describing this dimension, it raises a question about the degree of professional activity engaged in by the bulk of ITE teachers.

Dimension six, Enrollment: Frequent mentions were: *"Primarily males"*, *"No change [enrollment]"*, and *"Some enrollment increase."* This apparently evidences the continuation of the stereotyping of ITE courses as being more appropriate for males

than females. What it does not identify is the source of such stereotyping. It also reflects the mixed conditions with respect to enrollment and survival.

Table 18. Frequency of interviewee citation of critical incidents[1]

Rating 1		Rating 2		Rating 3		Rating 4		Rating 5		Rating 6	
Circled Items		Circled Items		Circled Items		Circled Items		Circled Items		Circled Items	
Item	Freq	Item	Freq	Item	Freq	Item	Freq	Item	Freq	Item	Freq
1A51	**39**	**2D31**	**31**	**3A53**	**37**	**4B31**	**27**	5E21	24	**6C31**	**38**
1A43	**29**	**2A51**	**30**	**3A41**	**29**	4A51	24	5C31	22	**6A41**	**28**
1A42	**27**	**2A53**	**28**	**3B11**	**28**	4A31	21	5E61	22	**6A51**	**27**
1B11	**26**	**2B11**	**28**	**3B31**	**26**	4B41	20	5A31	21	6C41	24
1A52	19	**2D41**	**28**	3A61	21	4A61	15	5B51	20	6A21	19
1A41	17	2A54	24	3A31	17	4A41	14	5D51	17	6A31	18
1A53	17	2A31	23	3A11	15	4B52	13	5A41	15	6C42	13
1B41	17	2A61	21	3A24	12	4C61	13	5B62	15	6A61	7
1A31	15	2D13	21	3A62	12	4A64	12	5C51	15	6C51	7
1A63	14	2A63	21	3A51	11	4B62	12	5D11	15	6B61	6
1A61	12	2C11	17	3A22	10	4C51	12	5A42	13	6C11	6
1B61	11	2D42	16	3A42	10	4A11	11	5D61	13	6C21	6
1B62	11	2A62	15	3B51	10	4C31	11	5A51	12	6C61	3
1A13	10	2D61	12	3A63	8	4C21	8	5D21	12	6C62	2
1A22	9	2A52	11	3B52	8	4C41	8	5C42	11	6A11	1
1A32	9	2A21	11	3A52	7	4A21	7	5A62	10		
11A11	8	2A64	11	3A54	6	4B53	7	5A52	9		
1B51	8	2A11	10	3A64	6	4A32	6	5B32	7		
1A62	7	2D32	10	3B61	6	4A62	6	5B61	7		
1A33	5	2B61	8	3A21	5	4A63	6	5D41	7		
1A12	4	2A12	7	3B12	5	4B51	6	5E51	7		
1A21	1	2B12	6	3A23	3	4B61	6	5A61	6		
		2B62	4	3B21	2	4B21	5	5B31	5		
		2D12	3	3B63	2	4D21	2	5A12	4		
		2D21	1	3B41	1	4C11	1	5C61	4		
		2D51	1	3B62	1	4D11	1	5B11	3		
								5C41	3		
								5A11	2		
								5A21	2		
								5A22	2		
								5D62	2		
								5F11	2		
								5A23	1		
								5C11	1		
								5C21	1		
								5D31	1		
								5E11	1		
								5B31	1		
								5B51	1		

[1]The critical incident code is: Number 1-Letter--Number 2--Number 3. It identifies a specific critical incident as follows: Given the example 2D31 and referring to the fourth page of the first instrument in Appendix C -- Number 1 (in this case a 2) means that the item is an incident describing the second dimension of change "Methodological change"; The letter D refers to strand D in this dimension, in this case "activities, change in nature of student activities"; Number 2 (in this case a 3) means the incident is in the third rating column from the left, which is labeled "conservative"; and Number 3 (in this case a 1) means that the incident is the first one in the D strand, in this case, "mixture of projects and traditional activities drawn from the craft era." Taken together this means that 2D31 is the first incident in the D strand's Conservative column on the #2 Methodological change page of the instrument.

Statistical analysis of dimensions of change

After these descriptive statistics were developed, the researchers possessed a much improved sense of the situation that complemented the inundation of impressions left over from the telephone interviews. Given this improved understanding, the analysis for significant relationships) among independent variables (school size, sample type, years of teaching experience) and the dependent variable (ratings of dimensions of change) could proceed. To reduce the number of analyses to a manageable number, and also to increase the stability of the results given the relatively small numbers in the leader and conservative samples, a composite criterion variable was created by averaging each interviewee's ratings on the six individual dimensions of change. Analysis of variance was used to test for statistical differences and the alpha level was set at $p<.05$ on an apriori basis. As pointed out in the instrumentation section, the outlier interviewer's data were excluded.

The most important analysis was that of sample type versus the criterion. Table 19 presents the resulting data. They revealed that the profiles of the three sample (Leader, Conservative, Random), which were depicted in Figure 7, were significantly different. To properly locate the nature of the differences, post-hoc analyses were run. These identified significant differences between the ends of the distribution (i.e., between Leaders and Conservatives) and also between the top and the middle (Leaders and Random). Notably, there was no significant difference between the Conservative sample and the Random sample. If the assumptions underlying the instrument and the sampling hold, this means the random sample, i.e., the population of ITE teachers in Illinois, is more like those designated as conservatives.

The researcher also investigated the influence of age on the criterion variable, i.e., the mean of the six dimensions of change ratings. To do so, each interviewee's age, a continuous variable, was recoded to create a categorical one. Three categories were established: young (up to 35 years), middle (36-46) and older (47 and up). Table 20 provides the results of this analysis. Significant differences in dimensions of change were noted between younger and middle aged teachers and between younger and older teachers. No difference was detected between middle and older teachers.

School size was another potential variable that might have an effect on the change process in ITE. Accordingly, an analysis was run of the school size variable recode (small = up to 500, medium = 501-1200, and large > 1201) against the criterion variable of $R_{1\text{-}6}$ mean. Shown in Table 21, the data generally reveal no significant overall differences that could be attributed to school size. Post-hoc analysis did reveal a significant difference between small and large schools but even that occurred only when using the least rigorous test (Fisher PLSD).

Table 19. Sample type (Leader, Conservative, Random) with dimensions of change[1]

One Factor ANOVA X_1: Sample Type Y_1: R1-R6 Means

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	34.265	17.132	14.486
Within groups	98	115.901	1.183	p = .0001
Total	100	150.166		

Model II estimate of between component variance = 7.975

One Factor ANOVA X_1: Sample Type Y_1: R1-R6 Means

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Leader	10	5.254	.873	.276
Conserv	10	2.971	.865	.274
Random	81	3.398	1.131	.126

One Factor ANOVA X_1: Sample Type Y_1: R1-R6 Means

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
Leader vs. Conserv	2.283	.965*	11.021*	4.695
Leader vs. Random	1.857	.723*	12.971*	5.093
Conserv vs. Random	-.427	.723	.685	1.171

* Significant at 95%

[1]Excluding data generated by Boyt but note that the findings did not change when they were included or when using SAS GLM or non-parametric (Kruskal-Wallis) tests.

Table 20. Age with dimensions of change

One Factor ANOVA X_1: Recode of Age Y_1: R1-R6 Means

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	19.169	9.585	7.139
Within groups	97	130.219	1.342	p = .0013
Total	99	149.388		

Model II estimate of between component variance = 4.121

One Factor ANOVA X_1: Recode of Age Y_1: R1-R6 Means

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
young	15	4.475	1.124	.29
middle	48	3.54	1.226	.177
older	37	3.135	1.078	.177

One Factor ANOVA X_1: Recode of Age Y_1: R1-R6 Means

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
young vs. middle	.935	.68*	3.722*	2.728
young vs. older	1.34	.704*	7.136*	3.778
middle vs. older	.405	.503	1.275	1.597

* Significant at 95%

Table 21. School size with dimensions of change

One Factor ANOVA X_1: Recode of sch size Y_1: R1-R6 Means

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	7.232	3.616	2.541
Within groups	114	162.245	1.423	p = .0833
Total	116	169.477		

Model II estimate of between component variance = 1.096

One Factor ANOVA X_1: Recode of sch size Y_1: R1-R6 Means

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
small	38	3.995	1.167	.189
medium	33	3.621	1.134	.197
large	46	3.408	1.254	.185

One Factor ANOVA X_1: Recode of sch size Y_1: R1-R6 Means

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
small vs. medium	.373	.562	.865	1.315
small vs. large	.587	.518*	2.518	2.244
medium vs. large	.214	.539	.308	.785

* Significant at 95%

Analysis of the IP-supplied documentation

The TPE also reviewed an extensive set of documentation supplied by the IPITE project staff. The purpose was to establish an overview of what had transpired in Illinois in order to properly evolve a context for the comparisons to analogous activities and products in other states. Appendix R contains a listing of the documents reviewed for this purpose. Overall, the IPITE project staff's record for documentation is exceptional -- often change project personnel get so involved in the dynamics and excitement of their mission that little attention is paid to the documentation necessary for formative and summative evaluation. This was not the case in Illinois. Of course, some gaps were identified, for example the establishment of a benchmark to be used later as reference points for studies like this one, but the prevailing balance is clearly favorably. The documentation even included evidence of systematic context establishing analyses such as those of other states' clustering systems and learning themes. The documents also evidenced significant attention to "horizon scanning" and the planning of proactive actions to address teacher and state needs.

The review of the Illinois documents revealed several points that need to be mentioned. One of these pertains to the issue of compliance versus internalization and implementation. Given the forces acting on state departments of education, it is not unusual to note the project's early reflections of concerns for the state goals for learning, local goals for excellence, special needs and equity initiatives and the like. What struck the TPE, was the absence of a record of significant attention to these thrusts in the IPITE's more recent documents. More importantly, these concerns were not highlighted to any degree by the interviewed teachers. Have these goals all been attained? Perhaps increased attention to matters involving reinforcement of the state goals for learning, and the publicizing thereof, would help teachers in proactively addressing the erosion of ITE programming caused by high school graduation and college entrance requirements?

Similarly, the entire concept of orientation level ITE curriculum programming needs to be realistically appraised. Can teachers genuinely expect that high school students will actually have a systematic awareness/exposure experience in JH/MS? If not, what are the relative merits of single technology system-focused courses (e.g., communication, transportation) versus a high school orientation course that comprehensively samples all of technology. Or, perhaps it is not even necessary that the comprehensive sampling criterion be met. Consider for example the model that the TPE considers the country's most powerful change agent (of actual practice) in the last twenty years. The reference is to the Pittsburg Middle School/Delta County model established by Michael Needen and Max Lundquist. Their approach is to teach illustrative concepts of technology and to concentrate on the processes technology involves rather than the enumeration and

subsequent checking-off of hundreds of competencies. Fun and student excitement are primary design considerations of this approach -- a characteristic that is certain to get essentialists squirming.

Furthermore, the comparison to the Pittsburg/Delta model also raises the question of the model program. The TPE found no highlighting of the existence of a model program in Illinois. One of the chief reasons that change has been accomplished in the comparison situations is that the advocates of change had something concrete to point to. This has been the case in many of the innovative initiatives of the past, e.g., the Alberta Plan, the Industrial Arts Curriculum Program, and the Explorations in Technology program), and current experience in Georgia, Kansas, Colorado and New York suggest that it remains critically important today.

Never-the-less, the orientation level curriculum materials are clearly well conceived and developed. They include important sections explaining key curriculum design concepts and recommendations enabling teachers to adapt the curricula to their local situation and time constraints. They do however, contain, by the TPE's standards, far too much information directed at the ITE teacher and not enough material that the teacher can use directly with the students. The student components of the New York State, West Virginia and Missouri Technology Learning Activities/Modules provide good examples of what might be emphasized more with good effect. It is the TPE's sense that teachers all over the country are wanting more activities that they can use directly with the students. The more recent activity supplements are clearly a step in the right direction but teachers typically want even more detail.

The document review also suggested early roots for the teachers' perception that the orientation curriculum's relative lack of sophistication and/or depth was a problem. Early self-evaluations by project staff addressed this point particularly with respect to the reception of the IPITE in suburban districts where there was a significant investment in unit shops. Despite a lack of discussion in recent reports, given the interview input, the problem remains and indeed looms as a significant one if widescale implementation is to be achieved in the large high schools. It is important to note that this problem is not unique to the IPITE. A review of history and an analysis of previous innovative industrial arts/technology education thrusts suggests that our profession has always had a problem of clarifying the nature of its high school level programming. Often it was just "more of the same only at a higher level." Critics typically wondered if this "higher level" actually existed. Furthermore, the TPE's review of the actual IPITE orientation level materials, including samples of the more recent addenda, confirms that the criticism is probably well justified. The curriculum materials; for all their quality and obvious investment of time, imagination and love; contain little high level interaction

with technology and its artifacts. Frankly however, the TPE cannot point to an outstanding example of a high school curriculum that does, with perhaps the exception of the British Oliver & Boyd-published, Ray Page initiated, series of *Modules in Technology*. This criticism does contain a positive aspect to it. In fact, the review of the Illinois curricula pointed out what a remarkable achievement it actually is. One of its chief design specifications seemed to be "How to teach about technology without any substantial investment in equipment or materials." Clearly this was accomplished. Unfortunately, though, the resulting activities send powerful, unwanted messages that overwhelm the reality of the learning experience they provide -- particularly to relatively naive (with respect to technology) audiences such as students and administrators. A student who wants to "max out the linearity of the frequency response of his car stereo at 200-1000 watts" is not likely to be impressed with a control and robotics simulation involving aquarium tubing, recycled syringes and toggle switches!

Finally, a review of the curricula reveals, what to the TPE constitutes a missed opportunity. Consider that it might be readily accepted that members of the public, parents, counselors and administrators, as well as in all likelihood industry's, perceptions see less difference between ITE programs and manual/industrial arts than the profession would like. Given this, it would seem important to incorporate in the student-targeted learning materials, a significant emphasis on the involving of parents and industry personnel, as well as other technology-using inhabitants of the students' environment, in student activities that demonstrate the technological nature of the IPITE program. These "significant others" could serve as reactors, judges, information sources, reviewers, design specification setters, problem identifiers, and the like. This capitalizing on the multiplier effect of thousands of students via such interactions would help in changing all important perceptions much more quickly, but it is an opportunity that seems to be slighted in the IPITE materials. For examples of how this could be accomplished, review Kjell-Jon Rye's student activity descriptions in various publications such as *The Technology Teacher*.

Overall, the IPITE staff are to be commended for their obvious concern for quality, as evidenced by the nature of the materials, and the thoughtful efforts that went into their conceptualization, design, development and evaluation. Indeed, their concern for formative evaluation is clear throughout the project. The profession's high regard for IPITE staff is prime evidence of its assessment and the TPE concurs that it is well deserved. Concurrent with the staff's attention to quality was their incessant efforts to disseminate the results. Project reports document very significant quantities (in proportion to the number of teachers in Illinois) of printings and distributions. More importantly, however, were the masses of workshops conducted throughout the project. These simply represent a phenomenal investment of effort in the change process that is

particularly important given the decline of state and local supervisors in hands-on, change-oriented activity. Furthermore, and to the project personnel's credit, all data converge on the evaluation of these inservice activities as exceptionally valuable experiences.

One observation remains unexplained by the documentation. Early reports evidenced significant involvement of a larger number of state universities than do later reports. Other than reflecting the national trend away from an emphasis on technology teacher education, in favor of industry-oriented programs, the TPE has not identified a reason for this shift. Given the recommendations advanced in this report's final section, it may be important to examine this question more carefully.

Conclusions & Discussion

The research interest launching this evaluation project was to ascertain the pulse of Illinois' ITE profession. Implicit in this question was the desire to establish a degree of confidence in "what we know" beyond "hunches" and intuition. More specifically, the primary purpose for the project was to secure a measure of the impact of the IPITE project. The TPE's conclusions will be presented in two sections, first the impact of the project and second, the pulse of the profession.

Impact of the project

Impact is a multi-faceted construct. It may be defined in terms of awareness, attitude, likes and changes of perspective among others. Pragmatically, however, impact may best be operationalized in terms of actual change in practice. Of these measures, the latter criterion is certainly the most rigorous. In effect, it represents the actualization of the others, which may be considered as precursor indicators or conditions, into reality. Conclusions with respect to, and in order of, these indicators will be presented in their sequence.

The data and a basic analysis clearly support the conclusions that Illinois ITE teachers are aware of the IPITE. Only 1.6%[1] for example indicate not knowing of the project. More important however, is the nature of the teachers' awareness. Probing with respect to their attitude towards the IPITE materials revealed 44% positive ratings, 26% negative and 27% neutral. This actually paints a more positive picture than interview impressions suggest is valid. The latter demonstrated such a variability in

[1]Given the project's sampling strategy it is likely that this is an underestimate but given its smallness, even a change in the order of two to five magnitudes would still result in a small percentage of teachers not aware of the IPITE.

understanding and misunderstanding that the TPE became concerned about the clarity and consistency with which the IPITE message was being sent.

Action is perhaps the critical measure of impact. The interviewed Illinois ITE teachers reported an exceptionally large percentage (84%) of IPITE workshop attendance. Only 8% indicated that they had never attended. Furthermore, many (62%) had attended more than one workshop. Given the effort required to attend workshops and the volume of competitors for teachers' time, this attendance rate is a very positive indicator -- particularly since most were not paid or required to attend. Both teachers and the IPITE project staff deserve special recognition for this achievement. The repeat rate is a particularly telling indirect measure of the quality of the learning experience provided by the IPITE workshops. Teachers would not return for experiences deemed less than worthwhile.

Translation of their awarenesses and workshop/course exposures into action forces teachers to interact with their environment (i.e., students, colleagues, supervisors, principals, curriculum committees and school boards). These all inject forces that act in addition to the teacher's own position with respect to the IPITE. The vector resolution of these forces, according to Kurt Lewin's force field model of change, results in the action that can be observed/reported.

Specifically, only 37 (29%) of teachers reported the use of a comprehensive overview course to implement the orientation level IPITE. A much larger number reported approaching orientation through one or more technology system courses, e.g, energy utilization, transportation, communication, production. Depending on the IPITE's assumptions/position with respect to the students' course-taking sequence in the program's scope and sequence from JH/MS through SHS, this implementation seems considerably less than what might be hoped for. Alternatively, it may reflect what can be feasibly accomplished within existing constraints and/or that teachers are actually implementing the IPITE within the envelope of relatively traditional courses.

The latter possibility was examined by investigating the extent to which teachers incorporated IPITE materials in their courses. Fifty six percent of the interviewees reported "some" usage. Only 16% said "no" usage and 13% reported "extensive" usage. Qualitatively, the interviews suggested that the bulk of the "some" responses meant less than 50% usage. Aligned with the IPITE's original intent, many mentioned significant adaptations. Perhaps related to this reason for the extent of adaptation, was the TPE's conclusion that there is a clear disparity between what the IPITE project curriculum developers view as high school level material and what the teachers do. Each interviewer received this message from multiple sources. A similarly safe conclusion is

that the workshop series and TNT were both very well received. Most teachers reported favorably on both products as well as on the people involved.

The TPE concluded that the interview instrument and procedure met or exceeded appropriate requirements for validity and reliability and that they served as an effective measure of impact. Given this necessary condition, with respect to the extent of change attributed to the IPITE, the TPE concluded that there were indeed readily distinguishable and statistically different groups of leaders and conservatives. Furthermore, the bulk of the profession, as represented by the random sample is much more like the conservative group than the leaders. This conclusion weighs relatively negatively on the IPITE's actual impact -- if accomplishing widescale change in all the state's classes is the criterion of success. However, the IPITE has, using the same data, successfully confirmed the existence of a cohort of teachers who, with a good deal of consistency, are demonstrating the IP most successfully. The distribution of rating mean averages (Dimensions of change ratings 1-6) shown in Figure 8 demonstrates best the status of Illinois ITE teachers with respect to the overall average of the interviewed samples (leaders, random and conservatives) combined.

Figure 8. Distribution of average$_{R1-6}$ dimension of change means

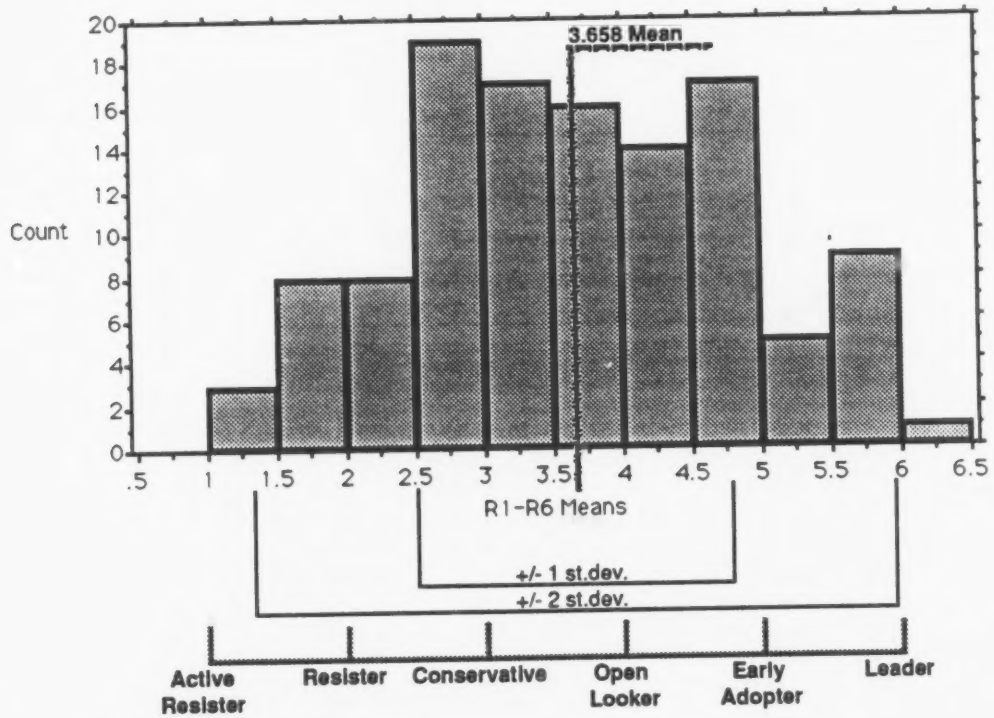
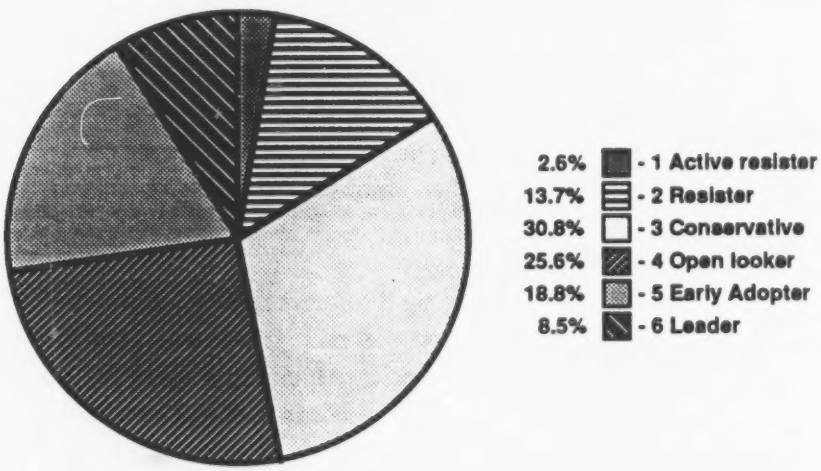


Figure 9 demonstrates that the predominance of interviewed ITE teachers are at the open looker or more conservative stage. The mode occurred in the conservative category and the median is right at the transition between conservative and open looker categories. The probabilities are high that this represents a genuine shift towards the directions advocated by the IPITE but, given the absence of a benchmark, there is no way of verifying that the IPITE did indeed cause the suspected shift. Nor, is there any way of verifying that a shift did in fact occur. Given the TPE's experience with innovative programs, however, **it seems certain that the state's mean is ahead of the curve with respect to what would have been the case without the IPITE**. This resulted in the TPE's overall conclusion that, in terms of their stage in the affective domain's hierarchy, the interviewed teachers were predominantly operating at the receiving and responding levels with only relatively few placing at the valuing and organization levels. This also speaks well of the IPITE project staff because it demonstrates that they have not "turned off" the bulk of the state's teachers with their relatively high profile, change-oriented program.

Figure 9. Percentages of interviewees at each stage of change



The TPE also concluded that, despite the widespread effort associated with the IP, considerable confusion and/or perhaps outright rejection exists. Frequently interviewees cited courses and/or positions that could only be viewed as part of a trade and industry program. Furthermore, and perhaps more pervasively, was the existence of a value system that favored depth over breadth and specific competencies over generalized ones.

Teacher age, it was concluded, is only a relatively minor influencing variable in terms of impact of the IPITE. Younger teachers tended to demonstrate more impact (higher R1-6

means) than older teachers. Given the small numbers of technology teachers graduating from universities today, little help can be expected from an influx of new teachers. Furthermore, since only about 4% of the variance was accounted for by age, this was not considered to be a strong factor. Similarly, school size was not found to be important in shaping impact. It was concluded therefore, that the individual teacher's own orientation and beliefs, and perhaps those of the significant decision makers in his/her environment, are more important in determining IPITE impact than mere age or school size. Interview comments suggested the possibility of a school location (rather than size) variable but this was not investigated.

Pulse of the profession

Throughout the evaluation, the researchers were impressed by the absence of involvement of key state associations. This was reflected in interview responses particularly about professional development and improvement assistance questions. Similarly absent were mentions of state department leadership activities and/or personnel. The TPE's view is that change is more effectively accomplished and reinforced when the three key forces in the profession (teachers, i.e., their association[s]; teacher educators, i.e., all university ITE departments in the state; and the state, i.e., the state supervisors for ITE) align and focus their efforts into a coherent overall plan. The TPE concluded that this was not the case in Illinois and that this significantly restricted the extent of the IPITE's impact. To be sure, many key elements of collaboration, progress and change were noted; but the overall picture did not evidence the degree of collaboration and unified effort needed to impact systematically across an entire populous state and at a high degree.

All interviewers reported very positive receptions by the interviewees. Almost all were very appreciative of being asked for their ideas and opinions. It was concluded therefore that the very existence of this evaluation and its association with the IPITE, was a positive activity for the IPITE. The interviewed teachers seemed genuinely interested in sharing their opinions -- many in fact seemed starved for such attention. Most wanted help in overcoming barriers although it was noted that many derived from matters outside the control of the local school or the IPITE project.

An example of the latter was the frequent mention of high school graduation requirements and college entrance requirements. It was concluded that the combination of theses two forces had a significant impact in reducing the numbers of student enrolled in IPITE as well as in creating a selection mechanism that depressed the quality of the students who did elect to enroll. This overall decline acts to reduce the impact of the IPITE given teacher riffing policies (typically last in first out) and amounts of investment in programs.

Recommendations

Given the findings of this study and the TPE's experience with other innovative program thrusts, the following recommendations are advanced. Note that the TPE deliberately chose not to restrict the scope of the recommendations to those that might be appropriately self-contained within the IPITE project. After all, the IPITE project is directed towards statewide implementation -- so shall be these recommendations.

The primary recommendation is to capitalize on the project's excellent effort and momentum by using it as a springboard for a coherent and even more pervasive statewide thrust that clearly and consistently commits the DAVTE, universities and the state's ITE association(s) to the formulation of a joint program. It is imperative that the state's teachers perceive their association as a strong advocate of the "new directions." This would be, in effect, a manifestation of "their" action and ownership. Because of this, the IPITE thrust would be increasingly perceived as a direction established from "within" instead of something imposed from "outside."

Similarly, it is critical that the DAVTE clearly designate a person to visibly and collaboratively lead and organize the implementation thrust. Note that these recommendations are not to be considered as criticisms of the actions to date of state association leaders and/or state consultants; rather, they are better viewed as perceptions of what is needed to make the transition to more widespread implementation. Also, it would be important that the state department establish a CIP data collection procedure that permits accurate annual tracking of ITE instructors, courses and enrollments.

It is also suggested that the IPITE project team review each of the following important recommendations and incorporate their priorities into a new long range plan. Note they are not listed in order of importance.

1. Communication of a clear message that the IPITE represents primarily a direction of change more than a specific curriculum that must be implemented. This clarification also needs to help teachers distinguish ITE from trade and industrial education programs and the appropriate roles for each.

2. Forging a larger coalition between the state education department, all teacher education programs, the current IPITE team and the state's ITE association(s).

3. Development and publicizing of a significant set of "high end" (in terms of technological sophistication and depth) activities in each of the four systems of technology courses.

4. Develop a package of activities to help teachers interact with science, mathematics and other discipline's instructors. The goal needs to be the establishment of a mechanism by which ITE can evolve a course, probably with very strict approval and credentialling standards, that will meet high school graduation requirements and college entrance requirements.

5. Continuation of the workshop series in a depth-building mode.

6. Continue the *TNT* in a manner that is similar to its current successful format.

7. Develop an initiative to help teachers address the urgent facility renovation and updating needs that exist. This should include the development and promulgation of detailed recommendations for equipment inventories for each system laboratory. An important part of this goal is the development of a succinct set of equipment selection criteria.

8. Develop a series of in-school public relations products that teachers can use with students, counselors and administrators. The purpose ought to target on:
   - recruiting more students into ITE
   - increasing the caliber of students electing ITE
   - increasing female enrollment

9. Assessing the opportunities for the configuration of IPITE materials into a flexible-length and schedule, variable credit course experience. The object should be to help teachers in structuring a learning experience that permits students to participate in other than the typical regular fixed time per day and week. A key component of this experience should provide students with the opportunity to work collaboratively with other instructors on joint projects and other academic subject material.

10. Given the frequently cited decline in student caliber, the development of a set of specially designed resources to interface the IPITE materials with the requirements of special needs clients is important.

11. Conduct an annual one-page feedback/evaluation survey in the *TNT* and also in the state association newsletters as well as hold open hearings at key state association conferences, e.g., IITEA and the IVA.

12. Compare the findings of this report with those of other evaluative/status studies (e.g., Dr. Robert Daiber's study of the perceptions of Illinois principals and Dr. Emerson Wien's workshop evaluations) to assemble a more comprehensive picture of the condition of ITE in Illinois than what was possible in this study.

13. Utilization of the AEA-developed critical incident instrument for a series of on-site visits paralleling this study. A part of this should involve the training of a cadre of observers in the proper use of this instrument as needed for reliable data collection.

Appendices

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Appendix F.	Most recent university course taken
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Appendix I.	Respondent attitude comments about IPITE
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Appendix M.	Comments about the quality and utility of IPITE orientation level materials
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Appendix A
Survey Response Card

Please respond to all questions as appropriate

A. I am ☐ willing ☐ not willing to participate in the telephone survey about Illinois' 9th and 10th grade Orientation to Industrial Technology program.

B. I teach 9th and/or 10th grade Orientation level ITE courses ☐ yes ☐ no

C. Call me at home: Area code _____ Phone _____. The best time to reach me is from _____ to _____ on Day(s) _____

Don't call after _____ p.m.!

D. Signed: _____

This card is addressed and ready to mail.
Please do so at your earliest convenience. Thank you for assisting in this important project.

Appendix B
Dimensions of Change

1. **Programmatic Change** [What is taught]
   - A. Curriculum
     1. Books, textbooks changed
     2. References installed
     3. Usage of IP Guides
     4. More technological activities
     5. Course content change
        - -newer technology
        - -more breadth/expansion of content, wide range of generalizable technology concepts
        - -cluster-based
        - -IP Guide based
        - -Reorganization/reemphasis of content
        - -Interaction of technology with society
        - -Interfaces ITE activities to math/science/social science curricula
   - B. Sequence
     1. Breadth to depth
     2. Development/addition of new courses per IP Guides
2. **Facility Change** [Where ITE occurs]
   - A. Equipment
     1. Less emphasis on industrial sized equipment
     2. Purchase of new technology-based equipment
   - B. Space
     1. Arranged to reflect technology
     2. Less "unit shop" space, i.e., specialized
3. **Methodological Change** [How ITE is taught]
   - A. Instructional approach changes
     1. More problem-solving
     2. Emphasis on systems approaches
     3. Uses ITE Orientation Curriculum Guide to plan courses
     4. Revises state guide included activities
     5. Develops new technological activities
     6. Regularly uses computers to develop and manage instruction
   - B. Sponsors a Technology Student Association
   - C. Participation in state-wide competitive events
   - D. Activities, change in nature of student activities [What is experienced]
     1. Less project work, student activities develop concepts more than manual skills
     2. More experiments
     3. More multiple activity
     4. Tried IP activities
     5. Hands-on activities approximate 80% of time (??)

4. **Externally oriented change** [How ITE is presented to "significant others"]
   - A. Public relations
     1. Parents, sends new information to them
     2. Administrators, sends new information to them
     3. Industry/business, involves them in advancing program
     4. Administrators, parents and counselors are aware of the shift to ITE
   - B. Insularity/Interdisciplinarity
     1. Linkage with science/math/social science teachers
   - C. Name change of courses, program or department
     1. To reflect technology
   - D. Encourages students to consider a career in ITE teaching
5. **Professional development** [What the educator does about ITE]
   - A. Participation in inservice activity
     1. IP Workshops, regional workshops
     2. Other, e.g., conference attendance
     3. Shares self-developed technological activities
     4. Attends national ITEA/AVA conference when within 600 miles
   - B. Performed an independent assessment of the IP
   - C. Pursues a planned professional development program
   - D. Association membership
     1. Belongs to ITEA and/or AVA-IAD
     2. Belongs to IIEA
     3. Belongs to technology-oriented association
   - E. Reads technologically oriented materials
     1. ITEA and/or AVA-IAD publications
     2. IIEA Technology News Today
   - F. Pursued a university course to enhance skills
6. **Enrollment** [Cumulative effect]
   - A. Enrollments are stable or increasing
   - B. Caliber of students is maintaining level or increasing
   - C. Increased numbers of females

Appendix C
Illinois Survey Final Instrument

Name: _____ Phone: _____ Date:_____
Time:_____

Technology Education Implementation Interview Schedule©
(circle or fill in answers as appropriate)

1. Introduce yourself & explain the purpose of this interview: To ascertain the state of practice in the field

2. Confirm the respondent's name and selection information:
   A. Teaches orientation level ITE: yes==>**continue** no==>**quit**
   B. School name: _____
   C. Type of school: JHS/MS SHS JHS/SHS combined
   D. Size of school (number of students grades 9-12): _____
   E. Respondent's position: Teacher Teacher/chair Department chair, etc.

3. Secure demographic data:
   A. Age ____ B. Gender: M F C. Length of time teaching: ____
   D. Grades taught: ___ 6 7 8 9 10 11 12 E. Highest Degree: Bac MS/MA/MEd EDS Doc
   F. Titles of ITE courses taught: _____
   _____
   _____
   G. Name of most recent full university course: _____

4. Extent of knowledge of the Illinois ITE Plan, the new guides, TNT, workshops, conferences, graduate courses:
   A. Heard of it/them B. Seen/reviewed it
   C. Actively using it, teaching from it D. Not heard of it/them

5. Attitude towards the IPITE materials (if respondent has seen them)
   A. Very positive B. Neutral C. Very negative

6. Dimension ratings (do on separate forms). Note, get one rating per dimension but circle all descriptions that apply and write in additional ones as appropriate.
   1. Programmatic Change ..... **[What is taught]**
   2. Methodological Change ..... **[How ITE is taught]**
   3. Facility Change ..... **[Where ITE occurs]**
   4. Externally oriented change ..... **[How ITE is presented to "significant others"]**
   5. Professional development ..... **[What the educator does about ITE]**
   6. Enrollment ..... **[Cumulative effect]**

7. Other comments (wrap-up)

   A. When did you last attend an IPITE workshop: This year Last year More than 2 years ago

   B. How many IPITE workshops have you attended in last three years? _____

   C. Describe the nature of your orientation course's central focus:

   Grade/s: ____ System: Communication Energy utilization Transportation
   Production Comprehensive overview course

   D. To what extent have you used the IPITE orientation level materials:

   Extensively---Some---Not at all _____

   E. What have you done with them?

   _____

   - help prepare curricula/student activities
   - help prepare for N[illegible]n central/state/other evaluation
   - help meet state requirements
   - help get better funding (state or local)
   - operate a better program
   - help administrators learn about my program
   - help parents learn about my program
   - access instructional resources

   F. How good are they? Were the activities useful?

   _____

   G. What value is the TNT periodical newsletter?

   _____

   H. What are the barriers to progress (towards further implementation of TE) as you see them?

   _____

   I. What has been the most helpful thing to you in enhancing the quality of your program?

   _____

9. Thank you

Dimensions of Implementation

1. Programmatic Change A. Curriculum [What is taught]						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
1. Books, textbooks changed 2. References installed 3. Uses ITE Orientation Curriculum Guide to plan courses 4. More technological activities 5. Course content change -newer technology -more breadth/expansion of content, wide range of generalizable technology concepts -cluster-based -IP Guide based -Reorganization/ reemphasis of content -Interaction of technology with society -Interfaces ITE activities to math/science/social science curricula 6. Shares self-developed technological activities	Teaches woodworking, cabinet making, mutilated blocks Actively resists change by speaking out against IPITE Uses only "shop" books	Does not have guide, not aware of guide No new textbooks	Is aware of, but does not have, the guides Same textbook as always Some new generation books	Has guide and has reviewed it Has tried one or two activities Some new generation books	Has incorporated the guides key points into curriculum Uses new generation textbooks and books from other disciplines Uses multiple information sources	Involved in developing the guide Has added to or gone beyond the guides Actively compares to other guides from other states Formally adopted and systematically incorporates the new directions
1. Programmatic Change B. Sequence 1. Breadth to depth 2. Development/addition of new courses per IP Guides	Unit shop focus				Has lesson plans and course unit structure documented	Has lesson plans and course unit structure documented

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2. Facility Change [Where ITE occurs]						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Equipment 1. Less emphasis on industrial sized equipment 2. Purchase of new technology-based equipment	Bought new cabinet-making equipment Industrial strength equipment	No computers	Bought industrial sized equipment	Some new technology equipment	Building some special purpose equipment	Table top technology equipment, emphasis on variety and new focus
B. Space 1. Arranged to reflect technology				Requested some new equipment		Equipment selected to build breadth, emphasis on variety
2. Less "unit shop" space, i.e., specialized	Multiples of equipment, equipment selected to build depth	Dirt all over, Junk equipment	Cleaned up existing facility		Secured some computer	Sophisticated computer peripherals
	No facility change or specific new unit shop facilities				Flexible arrangement of facility	Facility arranged specifically to support TE
					Minor renovation of facility to suit program	Extensive renovation of facility to suit program

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3. Methodological Change [How ITE is taught]						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Instructional approach changes 1. More problem-solving 2. Emphasis on systems approaches 3. Revises state guide included activities 4. Develops new technological activities 5. Regularly uses computers to develop and manage instruction B. Sponsors a Technology Student Association C. Participation in state-wide competitive events D. Activities, change in nature of student activities **[What is experienced]** 1. less project work, student activities develop concepts more than manual skills 2. more experiments 3. more multiple activity 4. tried IP activities 5. Hands-on activities approximate 80% of time (??)	Build projects concentrates on skills No standard curriculum Same old activities No student club or extra curricular involvement of students in shop No statewide participation All students always do the same thing	Emphasizes the knowledge that goes with skill	Many lectures to the class Mixture of projects and experiments Some updated projects	Mixture of projects and experiments Occasionally tries some new activities from the IP guides	Uses experiments, brainstorming, design, black box approaches Has clear list of objectives stated in performance terms Implements many of the IP guide activities Operates only local student organization Uses computer to support instruction	Emphasizes problem solving and/or technological concepts Emphasizes systems approach Develops and refines new technological activities Sponsors student association e.g., TSA, with national affiliation Participates in state technology competitions Completely individualized program

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4. Externally oriented change [How ITE is presented to "significant others"]

Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Public relations 1. Parents, sends new information to them 2. Administrators, sends new information to them 3. industry/business, involves them in advancing program 4. Administrators, parents and counselors are aware of the shift to ITE B. Insularity/Inter-disciplinarity 1. Linkage with science/math/social science teachers C. Name change of courses, program or department 1. To reflect technology D. Encourages students to consider a career in ITE teaching	Believes TE is a fad that will pass No PR or PR that reinforces "shop" image Eats lunch in shop with janitor	No PR action No flow of information to the various constituencies No time for "that stuff" Considers themselves unqualified No action in the last 10 years	Intermittent "hit and miss" information flow Gives lip service to interaction but not much is actually done Not even considering it	Intermittent "hit and miss" information flow Gets input from science & math teachers Considering the possibility thereof	Has informed parents or school board about the program's changes Interacts with other teachers Teaches some specific science & math content applications has proposed, or recently effected, a name change	Program name change and systematic PR attempt to change perceptions Secured media exposure Works actively with science and math teachers Has advisory council with regular meetings Knowledge of state goals for learning (science and generalizable skills)

55

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5. Professional development [What the educator does about ITE]						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Participation in inservice activity 1. IP Workshops, regional workshops 2. Other, e.g., conference attendance 3. Attends national ITEA/AVA conference when within 600 miles	Attends IPITE meetings but only to argue against the direction Never attends & "bad-mouths" the associations	Must be paid/coerced to participate Looking to retirement Does not know of conferences	Vague curiosity Expresses no interest	Attends when convenient Would like to attend Starting to get interested, sees some potential and value	Attends frequently Has attended when possible	Attended 3 of the last 6 conferences Systematically evaluated, compared to other states and identified strengths & weaknesses
B. Performed an independent assessment of the IP	Has reviewed it and hates it Has negative feelings about such plans	Is not aware of guides No plan exists	Has reviewed (scanned) the guides Hit & miss activities	Hit & miss activities	Has evaluated materials carefully Several activities but no organized, long range plan	Implements a planned PD program actively, degree or otherwise, e.g., sabatical
C. Pursues a planned professional development program D. Association membership 1. Belongs to ITEA and/or AVA-IAD 2. Belongs to IIEA 3. Belongs to technology-oriented association	Does not belong to state or national associations	Does not belong	Is thinking about joining Doesn't know about them	Is thinking about joining Knows the associations	Belongs and is active in state organizations	Belongs and is active in state and national associations and technical associations
E. Reads technologically oriented materials 1. ITEA and/or AVA-IAD publications 2. IIEA Technology News Today		Reads only "shop" magazines			Reads educational journals only	Reads both professional and industrial strength journals
F. Pursued a university course to enhance skills	Taken no courses since BS graduation					

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6. Enrollment [Cumulative effect]						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Enrollments are stable or increasing		Declined significantly	No change	No change	Has increased somewhat	Has gone up considerable
B. Which students are enrolling	Only least able students participate			Some talented students are beginning to participate		Some significant proportions of high talent students
C. Number of courses offered	Many fewer courses offered		No change			New courses have been added

Affective Rating:

Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
			Receiving =>	**Responding=>**	**Valuing=>**	**Organization=> Characterization**

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Appendix C
Illinois Survey Instrument -- Rank Order Version
Dimensions of Change Pages

Dimensions of Implementation

1. Programmatic Change						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Curriculum [What is taught] 1. Books, textbooks changed 2. References installed 3. Usage of IP Guides 4. More technological activities 5. Course content change -newer technology -more breadth/expansion of content, wide range of generalizable technology concepts -system/cluster-based -IP Guide based -Reorganization/ reemphasis of content -Interaction of technology with society -Interfaces ITE activities to math/science/social science curricula	10==1A13 Only "shop" books in laboratory 8==1A11 Teaches only woodworking, cabinet making, exercise blocks 4==1A12 Actively resists change by speaking out against IPITE	9==1A22 No new textbooks 1==1A21 Does not have guide, not aware of guide	15==1A31 Is aware of, but does not have, the guides 9==1A32 Same textbook as always 5==1A33 Some new materials/books	29==1A43 Some new materials/books 27==1A42 Has tried one or two activities 17==1A41 Has guide and has reviewed it	39==1A51 Has incorporated the guides key points into curriculum 19==1A52 Textbooks & resources from other disciplines 17==1A53 Multiple information sources	14==1A63 Actively compares to other guides from other states 12==1A61Formally adopted and systematically incorporates the new directions 7==1A62 Involved in developing the guide
B. Sequence/organization of courses & program						
1. Breadth to depth 2. Development/addition of new courses per IP Guides	26==1B11 Unit shop focus	1B21	1B31	17==1B41 Has lesson plans and course structure documented	8==1B51 Has lesson plans & course structure documented & a complete set of work-station learning modules	11==1B61 Emphasizes breadth of technology by activities 11==1B62 Has added to or gone beyond the guides

Interviewee comments with respect to dimension 1. Note the citation codes represent where they would occur in the actual instrument.

1A14 - Has been intimately involved in development of guide, using it extensively
1A14 - Has pretty much written my own material in module form; much like Illinois Plan; uses other numerous resources; some use of guide
1A23 - Doesn't use guides much
1A23 - Don't use state guides
1A23 - Have done own curriculum, not aware of state guides
1A23 - Needs to rewrite for his teaching level
1A23 - No real effort
1A23 - Still with basic electronics, trying to use manuals and updated texts
1A23 - Traditional content
1A23 - Use a book, use some ITE stuff, mass production from ITE
1A23 - Use books & trade magazines
1A23 - Use multiple texts, energy & transportation
1A23 - Using Illinois guides extensively, others updated, technology Br??? supplemental materials
1A23 - Using several different books, using the guide some
1A23 - Wood book, not much from guides
1A24 - 3 basic texts (old books)
1A32 - Added some elements from IL plan to blend.
1A32 - Latest textbook - manufacturing manual with small engineering
1A34 - Combining new textbooks
1A34 - Manufacturing and Transportation
1A34 - No longer teacher Illinois Plan
1A34 - Older curriculum activities
1A34 - Use guides primarily for activities
1A34 - Using a college text
1A35 - Using electricity textbooks in Energy Utilization
1A42 - 1/3
1A42 - Advisory Council
1A43 - every ??? year
1A43 - Forced to long text. General comments - there are things that work and things that don't.
1A44 - Books changed over
1A44 - Illinois plan is geared for less hands on and more technical. Doesn't lend itself as well for one school systems. .We use parts appropriate for our students
1A44 - Illinois plan is geared for less hands on and more technical. Doesn't lend itself as well for one school systems. We use parts appropriate for our students
1A44 - Used, what's ???ment
1A44 - VIP program
1A45 - To Illinois Plan modifies in handouts
1A45 - Use the guides some, don't have high ability students - comments
1A45 - Use the guides some, don't have high ability students - comments
1A51 - All 4 areas
1A51 - Some
1A52 - (some)
1A54 - Most from Illinois Plan -adapted a lot; supplement with text
1A54 - Transportation - western publishing
1A61 - Idea
1A63 - Exploring Communication, Exploring Production
1A63 - review of textbooks
1A64 - Acting using guide
1A64 - MATERIALS FROM Consortium
1A64 - Videos, cable
1A65 - Integrating with other disciplines, will be structured with next revision.
1B12 - Have to have programs which allow for the mixed ability level of students;
1B12 - Have to have programs which allow for the mixed ability level of students; General comments - Went from traditional drafting to CAD - 50%, using course work developed for University of IC, keeping in touch with industry is important, this was a result of workshop with people in industry, college professors and business and graduates - and not conventional classes.
1B21 - No
1B21 - No new courses
1B21 - Not yet
1B21 - Uses several different texts
1B31 - Has sequence he follows
1B31 - Students don't have background for "high tech"
1B31 - There's no curriculum
1B36 - Teach mostly electricity. General comments - For what the state wants, they haven't put enough money into it. 1 Auto
1B41 - Some
1B42 - Broad based in 8th and 9th - fairly specialized at 10, 11, 12.

1B52 - USES COOPERATIVE LEARNING APPROACH, RELATES TO INDUSTRY; RC CARS ARE CENTRAL FOCUS OF THE PROGRAM, uses as production unit in mfg, drafting, CAD, photo & silkscreening for teams, transportation, energy utilization,

1B61 - writer of student guide

3 IA, 1Ag – now 2 teachers. They have killed Agriculture and trying to get one teacher to cover 4 schools. They (administration) are not helping.

5 - Has tried guides as much as possible; seems to be a little short in material; looking for additional material; using whatever I can find from other states

5 - Use Illinois Plan materials rather heavily, have taught to them and have used their activities, ??? now texts

Addressed from vocational center viewpoint

2. Methodological Change [How ITE is taught]						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Instructional approach changes 1. More problem-solving 2. Emphasis on systems approaches 3. Uses ITE Orientation Curriculum Guide to plan courses 4. Revises state guide included activities 5. Develops new technological activities 6. Regularly uses computers to develop and manage instruction	10==2A11 Concentrates on skills 7==2A12 All students do the same thing	11==2A21 Emphasizes the knowledge that goes with a focus on skill	23==2A31 Mainly lectures and demonstrations to the class	2A41	30==2A51 Uses experiments, brainstorming, design, black-box approaches 28==2A53 Implements guide activities 24==2A54 Uses computers to support instruction 11==2A52 Clear list of objectives	21==2A61 Emphasizes problem-solving and/or techno-logical concepts 21==2A63 Emphasizes stu-dent-centered lrng 15==2A62 Emphasizes systems approach 11==2A64 Extensively individualized, self-directed learning
B. Sponsors a Technology Student Association	28==2B11 No student club or extra curricular involvement of students 6==2B12 No statewide participation	2B21	2B31	2B41	2B51	8==2B61 Sponsors student association e.g., TSA 4==2B62 Participates in state technology competitions
C. Participation in state-wide competitive events	17==2C11	2C21	2C31	2C41	2C51	2C61

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D. Activities, change in nature of student activities [What is experienced] 1. less project work, student activities develop concepts more than manual skills 2. more experiments 3. more multiple activity 4. tried IP activities 5. hands-on activities approximate 80% of time	21==2D13 Traditional activities and projects 3==2D12 No standard curriculum 2D11 Students all build projects exclusively	1==2D21	31==2D31 Mixture of projects and traditional activities drawn from the craft era 10==2D32 Some updated projects	28==2D41 Mixture of projects activities and/or experiments drawn from industry or technology content base 16==2D42 Occasionally tries some new activities from IPITE guide	1==2D51	12==2D61 Develops & refines new technological activities

Interviewee comments with respect to dimension 2. Note the citation codes represent where they would occur in the actual instrument.

2A13 - Project-oriented
2A21 - Very little (little access to computers)
2A22 - A lot of cooperative learning
2A22 - Do considerable problem solving activity, wind ???, bridge building, research ???, mock up
2A22 - heavy skill emphasis, supplies students to print shop, teaching vocational rather than I.A.
2A22 - Large woods projects, hand tools, measurement, sharpening, grain direction, case construction
2A22 - Lecture much emphasis in skill development, some problem solving
2A22 - Lecture, demo, woods projects, smaller projects, would like to do some plastics, traditional by and large
2A22 - Lectures; study guides that come with books; film strips
2A22 - Lots of hands on; problem solving orientation; reincorporating old activities to new technology
2A22 - No
2A22 - Problem solving both individual and group
2A22 - Some small activities, some problem-solving, needs more skill
2A22 - Still need hands-on but need to do more problem solving
2A22 - Tend to be problem-solving and experimental
2A22 - Use problem-solving and some projects, small experiments, passive solar houses experimentation
2A22 - Uses a wide variety of methods - small group work, discovery, problem solving, some experimentation, video
2A22 - Working to incorporate new technology activities; hates the ??? away skill development; getting low kids; kids don't know how to work
2A23 - A lot of problem-solving
2A24 - Traditional lecturer - it's the best way to learn; also like to have students look up information and solve their problems; my modules are all set up that way
2A25 - Skill emphasis
2A31 - Lab relates
2A32 - 10 minutes instruction; work in 1 at 90% of time;
2A32 - Start with skill development first at exploratory level-problem solving freshman/sophomore get skill part
2A32 - Teaches building trade class
2A41 - A lot of problem-solving history, brainstorming; some basic research-kids are bored with it

2A41 - Developed a few
2A41 - Do experiment but don't have test equipment
2A41 - Just starting
2A41 - Manufacturing group work
2A41 - More hands on and videos
2A41 - Mousetrap car
2A41 - Mousetrap cars
2A41 - Set up a production line
2A41 - Some manufacturing if they get done early
2A42 - Teamwork
2A51 - Simulators
2A51 - Some
2A54 - for rockets, 2 weeks.
2A54 - In drafting
2A55 - Group work
2A55 - Uses VCR for communication
2A61 - A lot of group work
2A61 - CNC only
2B21 - Drafting contest
2B21 - I'm not, but other are - I leave it to younger faculty
2B21 - Mass production design jigs & fixtures
2B21 - Working toward this
2B31 - Electronics club only
2B31 - Heart surgery - doesn't have the time, has small children
2B31 - Lecture
2B31 - Lots of student associations, won state title go members
2B31 - Starting VICA
2B41 - Encourages problem-solving
2B41 - VICA, TEAMS
2B51 - CNC ???
2B51 - Co-op, FFA
2B51 - Has local club not affiliated with TSA
2B51 - VICA
2B52 - COMPUTER TECHNOLOGY
2B61 - 50-50
2B62 - ??? 500, Scholar Bowl
2B62 - Organizing for this year
2C11 - 65% 70% HANDS ON 2D51
2C11 - No
2C11 - None
2C31 - no but plans to in the future
2C41 - IEA
2C41 - involves RC vehicles as after school activity, uses LANSAT c/w signal on field, buys photo to show communication
2C41 - Lots of little activities
2C41 - Not on orientation level
2C41 - Occasional
2C41 - Orient to industry
2C41 - Welding
2C51 - CAD CENTER
2C51 - Drafting competition
2C51 - VICA
2C51 - YES
2C51 - Yes, for FFA
2C51 - Yes; 1D51 - 30% hands on
2C61 - Many contests are a blessing, they really motivate
2C61 - State drafting competition
2D13 - + CAD; General comments - exploratory program is not a prerequisite for other program, majority of students (50-60%) at this school or below 9th grade or technology.
2D13 - Vocational
2D21 - Most kids work in pairs so emphasize social dimension; kids grade and analyze own worksheets.
2D41 - Few
2D41 - Manufacturing
2D42 - 60% hands on
2D42 - Full blown mass production
2D51 - 60-70% hands o n
2D51 - 60-70% hands-on
2D51 - 75% hands on
2D51 - 80% hands on
2D51 - 90% hands
2D51 - About 60% hands on
2D51 - CARDS CAD/CAM
2D51 - Hands 70/30
2D51 - Jig fixtures
2D51 - Mass production
2D51 - Using several activities
2D52 - WORK ALLS. (OFF TO THE SIDE) STUDENTS CHECK IN DISTRICT DON'T CURRENTLY HAVE ONE
2D62 - Applied math and physics
2D62 - modifies to meet needs
2D62 - More teamwork
2D62 - shows information with surrounding schools in the area
2D63 - Creative thinking
2D64 - Problem-solving

3. Facility Change [Where ITE occurs]						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Equipment 1. Less emphasis on industrial sized equipment 2. Purchase of new technology-based equipment	15==3A11 Bought new cabinet-making equipment	12==3A24 "Industrial strength" equipment 10==3A22 Multiples of equipment to enable all (or many) to do same thing at same time 5==3A21 No computers 3==3A23 Much junk or salvaged equipment	17==3A31 Bought industrial sized equipment	29==3A41 Some new technology equipment 10==3A42 Requested some equipment	37==3A53 Added computers to laboratory 11==3A51 Selected equipment to build breadth rather than depth 7==3A52 Built special purpose technology equipment 6==3A54 Localized micro computers only	21==3A61 Table top technology equipment 12==3A62 Equipment emphasis is on variety, breadth and new focus 8==3A63 Sophisticated peripherals e.g., modems and scanners 6==3A64 Simulators
B. Space 1. Arranged to reflect technology 2. Less "unit shop" space, i.e., specialized	28==3B11 No facility change 5==3B12 Has added new unit shop facilities	2==3B21	26==3B31 Cleans up existing facility	1==3B41	10==3B51 Arranged facility for flexibility 8==3B52 Renovated facility	6==3B61 Facility arranged specifically to support TE 2==3B63 Deliberate creation of new visual image 1==3B62 Non-traditional laboratory furniture and arrangements

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Interviewee comments with respect to dimension 3. Note the citation codes represent where they would occur in the actual instrument.

3A12 - No new equipment
3A12 - No new equipment in the last four years for lack of funds.
3A12 - No new equipment-trying to maintain what they have
3A12 - Printing press and large scale equipment
3A12 - Woods equipment big time
3A23 - Old but good
3A24 - 1/2 dozen metal lathes
3A25 - Short on money for equipment (router, jig saw)
3A32 - Adding electricity testing equipment; some digital; getting computers; some modular app???
3A32 - Attempting to install industrial system
3A32 - Auto analyzer
3A32 - Bought new table saw; D.C. welder; had computer donated to us - use computer more than woods equipment
3A32 - Brand new electrical lab; full range of test equipment paid for out of p:::
3A32 - CAD lab about 3 years. No other major improvement
3A32 - Computer lab CAD
3A32 - Computers for 10 years, IBM, AUTOCAD, more into robotics, table top, NC, simulating; facility is in process of updating
3A32 - Desktop publishing, CAD, silkscreening, photography
3A32 - Does some consulting in other schools on computers; have pursued numerous grants for the purchase of graphics art equipment, desktop publishing, some table top technology.
3A32 - Engine analyzer, some computers, CAD-CAM
3A32 - Heavy printing equipment of industrial type
3A32 - Little added, No new equipment
3A32 - Minimal improvement
3A32 - New press in printing
3A32 - No new equipment
3A32 - No new equipment
3A32 - No new equipment, using computers for CAD & CNC
3A32 - Plastics equipment, CAD in drafting, he doesn't use it in woods, miniature mill in metals, no change in facilities
3A32 - Retaining some wood shop, bur from manufacturing viewpoint
3A33 - Apple IIe - auto, Printshop IIGS. General comments - need more money for training; need students that are capable of using "technology" equipment.
3A33 - Press
3A33 -Purchased computers for CAD/election??
3A41 - CAD and Versa CAD
3A42 - No new equipment
3A42 - Silk screen, transportation
3A43 - Added Welch Silkscreen, computer software. General comments - no capital outlay.
3A43 - Mainly new materials
3A43 - Robot arms
3A43 - Very little use for orientation
3A44 - Not spending big buck
3A52 - CAD teaches all drafting; General comments - Have received a lot of financial support for the last 7 years fro CAD.
3A53 - CAD in drafting
3A53 - New CAD lab -10 state??;3B63 - Working to flexible manufacturing workall
3A61 - CNC Trainer???
3A61 - Lego; robotics
3A62 - Brand new
3A64 - Laser training, fiber optics
3A65 - CAD system
3A65 - Old lab is gone
3A66 - New inject ???
3A67 - Robotics training
3B11 - Have adequate span
3B11 - no facility change
3B12 - Graphics
3B13 - Bought 14 new routers
3B13 - No recent facility renovation, No change
3B21 - 6 computers, hydraulic trainer
3B21 - 6 years, also got CAD

3B21 - Have unit shop; General comments - They did away with middle school program. They expect one person to do it all. I'm comfortable with everything but "electronics". 24 kids in 18 x 24 room addition project - that's not right.
3B21 - No facility change
3B21 - No facility renovation
3B21 - No new equipment
3B21 - some renovation
3B22 - Current hi-tech work systems
3B31 - Repaired
3B32 - Bought it to improve existing program, not in response to IL Plan.
3B32 - Existing unit shop
3B32 - No change - would like large woodshop
3B32 - Rearranged shop
3B32 - Things pretty much fixed in place; no major renovation
3B41 - Brand new computer
3B41 - Maintained woodworking facility
3B41 - Minor improvement - floors, cabinets
3B53 - DEVELOPMENTAL LAB WITH CLEAN ROOM SPECIALTY LAB
3B61 - More portable than stationary; switch boxes
3B62 - New Principles of Technology lab for high school
3C31 - Industrial Arts
3C32 - Computer network system, no facility renovation
4B32 - Wants desktop publishing, probably Mac
4D51 - YES

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4. Externally oriented change [How ITE is presented to "significant others"]						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Public relations 1. Parents: sends new information to them 2. Administrators: sends new information to them 3. Industry/business: involves them in advancing program 4. Overall: administrators, parents and counselors are aware of the shift to ITE	11==4A11 No PR or PR that reinforces shop image	7==4A21 No time for PR and external information flow 4A22 Considers themselves unqualified to communicate TE to external constitutencies	21==4A31 Intermittent or hit and miss activities 6==4A32 Gives lip service to external relations but not much action.	14==4A41 Intermittent or hit and miss activities	24==4A51 Has informed parents and/or school board and/or administration about the change to TE	15==4A61 Broadcasted radio &/or TV programs, news releases about the new program 12==4A64 Maintains link with industry, chamber of commerce, etc. 6==4A62 Gives workshops to help implement ITE 6==4A63 Established & uses an advisory council
B. Insularity/Inter-disciplinarity 1. Linkage with science/math/ social science teachers	4B11	5==4B21 Lunches alone or with support staff	27==4B31 Not considering links with other departments as feasible	20==4B41 Gets some support from math and/or science teachers	13==4B52 Teaches some math and/or science applications in TE 7==4B53 Interacts with other teachers 6==4B51 Knows the state goals for learn-ing in science, math & general-izable skills	12==4B62 Works actively with the school's other teachers 6==4B61 Implemented activities to reinforce the state's goals for learning in science, math and generaliz-able skills
C. Name change of courses, program or department 1. To reflect technology	1==4C11 Believes TE is a fad that will pass	8==4C21 No overt hint that TE is a desirable direction	11==4C31 Not considering a name change for the program	8==4C41 Considering a name change for the program	12==4C51 Has proposed to implement a name change	13==4C61 Program name change & systematic PR to change perceptions
D. Encourages students to consider teaching ITE	1==4D11	2==4D21	1==4D31	4D41	4D51	4D61

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Interviewee comments with respect to dimension 4. Note the citation codes represent where they would occur in the actual instrument.

4A11 - Keep supervisors informed about IL plan but not in an attempt to persuade them; In Chicago area, just about all are not really participating in ILL plan. We respond if we feel it better for students - the program.
4A12 - Program sells itself
4A12 - School sponsored PR
4A12 - Teaches ??? student's kids (very effective - not much PR
4A23 - my former students have kids big wood show at end of year; B - Don't want to change program
4A23 - Students are his public relations
4A23 - Superintendent says its not worth the time to pursue it
4A33 - Advisory council show
4A33 - Career cooperative
4A33 - Coop positions for drafting students
4A33 - Flier to all incoming 8th graders - aggressive
4A33 - Is doing this more and more; does a lot of this through students, much of this is through
4A33 - No external advertising
4A33 - Not much external or internal P.R.; counselor working against us
4A33 - One of our weakest areas, no one has time to do it, director should do it.
4A33 - Parents Night, invited the press-great turnout, displays out for whole school
4A33 - PR - Technology not really introduced - haven't had time, not been involved very long
4A33 - Project fair at the mall, not much else
4A33 - Project take home, local newspaper
4A33 - Publish departmental brochure - done in house, goes to all junior high students, do a parent's night, have a student fair
4A33 - Regular open houses
4A33 - TSA articles, newspaper articles, contact with parents
4A33 - Very active (articles, radio)
4A34 - Do a good job of selling program in house to kids
4A34 - Quarterly newsletters
4A34 - Very limited
4A34 - Vocational programs have pretty good PR
4A35 - Attempting to do a grant
4A35 - open houses
4A41 - In spring have an exhibit - open to public
4A42 - Administrative, very little industry involvement, local community PR
4A42 - Good for system person designated for PR - newspaper articles on program and distribute newsletter
4A42 - Press releases
4A52 - Brochure, video tape
4A52 - Made recruiting video
4A52 - Open house
4A52 - Publishes drafting ??? to all counselors
4A52 - Through TSA chapter
4A53 - Puts out a newsletter
4A61 - Trying, write newsletter articles
4A62 - Summary intern practice; production ???, use local media; news releases in new equipment
4A63 - received technics list
4A63 NEWS MEDIA COME RT WRITE ARTICLES IN LOCAL PAPER
4A64 - CAD; General comments - have gone from 30 teachers to 15 because of decline in overall enrollment of school
4B11 - Active with guidance counselors
4B11 - New principal wants more - some math science contact
4B11 - Stick to themselves. Everything is categorized according to ILL Plan
4B11 - Work with whole faculty in mass production (business math, science)
4B22 - Do small engines for community
4B22 - Interacts with teacher of ??? discipline
4B22 - No I.A. club or advisory council
4B22 - Some intermingling
4B22 - Uphill battle
4B22 - Very little information exchange in house
4B22 - Work well with math/science occasionally, no PT
4B31 - Can't approach high
4B32 - No administrative support
4B32 - Our printing area, has been around in ??? in this area
4B32 - With math/science starting a journal
4B41 - ??? with science to teach a parallel course to IP
4B41 - Tried and failed, e.g., principles of technology

4B42 - Encourage students taking drafting to take math class for each drafting class taking
4B42 - Some effort
4B42 - Very little
4B42 - We will be working with Matt on vocational materials course
4B51 - Yes
4B63 - Participation in workshops
4B64 - Host visitation
4C11 - Runs in circles
4C31 - Industrial Technology [2]
4C32 - Coop. & Technical Education
4C32 - Industrial Arts [8]
4C32 - Industrial Vocational Department
4C32 - Practical Arts Industrial Education
4C32 - T & I
4C42 - Industrial & Technical Education
4C42 - Industrial Education [5]
4C42 - Industrial Education; Tech Prep
4C42 - Industrial Technology [6]
4C42 - Industry and Technology [2]
4C42 - pendulum will swing back some
4C42 - Technical Education
4C51 - Industrial Technology [3]
4C52 - Technology Department
4C61 - Technology
4D11 - Pushes students to college 80% one year
4D11 - Swamped with students
4D31 - Program name changed
4D31 - Very little
4D31 - Vocational Industrial Technology
4D41 - A little
4D41 - SOME, BUT NOT WITH MUCH SUCCESS
4D41 - Son in industrial technology
4D41 - Yes
4D41 - Yes, some
4D41 - Yes, some, if students show interest
4D51 - Have a lot of support for the program from the community
4D51 - Technology Education
4D51 - Yes
4D51 - YES, SOME very interested
4D61 - Yes, had 3 students get into it
4D61 ?? (AT THE BOTTOM) HITTING IT HARD THE LAST 2 YEARS , GAINING GROUND, TRYING TO TURN LEAD OF ADMINISTRATION
4F31 - YES

5. Professional development [What the educator does about ITE]						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Participation in inservice 1. IP Workshops, regional workshops 2. Other, e.g., conference attendance 3. Shares self-developed technological activities 4. Attends national ITEA/AVA conference when within 600 mi.	4==5A12 Never attended a national conference 2==5A11 Attends IPITE meetings but only to argue against the direction	2==5A21 Must be paid/ coerced to go 2==5A22 Looking to retirement 1==5A23 Doesn't know conferences	21==5A31 Expresses no real interest in attending national conferences	15==5A41 Attends when convenient 13==5A42Would like to attend national conferences	12==5A51 Attends frequently 9==5A52 Has attended national meetings when possible, made effort to make it possible	10==5A62 Offers workshops for other teachers 6==5A61 Has attended 3 out of the last six national conferences
B. Performed an independent assessment of the IP	3==5B11 Has reviewed IP but hates it. Has negative feelings that the IP even exists	5B21 Is not aware of IP	7==5B32 Has reviewed/ scanned the IP materials 5==5B31 Vague curiosity about IP	5B41	20==5B51 Has evaluated the IP carefully	15==5B62 Has visited many other school sites 7==5B61 Has evaluated, compared to other states, & identified strengths & weakne'es
C. Pursues a planned professional development program	1==5C11	1==5C21	22==5C31 Hit and miss professional activities	11==5C42 Hit and miss activities; several recent ones 3==5C41 Starting, sees some possibilities	15==5C51 Significant professional development activity but no organized long-range plan	4==5C61 Implemented a planned professional development activity, degree program, sabatical etc.
D. Association membership 1. Belongs to ITEA &/or AVA-IAD 2. Belongs to IIEA 3. Belongs to technology-oriented association	15==5D11 Does not belong to state or national associations	12==5D21 Does not belong to a national organization	1==5D31 Is thinking about joining	7==5D41 Knows associations and has materials but not yet joined	17==5D51 Belongs and is active in state organization	13==5D61 Belongs and is active; state & national assoc. 2==5D62 Belongs to technology (non-ed) associations
E. Reads technological materials, 1. ITEA and/or AVA-IAD items 2. IIEA Technology News Today	1==5E11	24==5E21 Reads only "shop" oriented literature	5E31	5E41	7==5E51 Reads educational journals only	22==5E61 Reads professional and industry journals
F. Pursued a university course to enhance TE capability	2==5F11 Taken no courses since BS	5F21	1==5F31	5F41	1==5F51	5F61

Interviewee comments with respect to dimension 5. Note the citation codes represent where they would occur in the actual instrument.

5A32 - Attend COOP vocational workshop
5A32 - ITEA-wants to go, just joined; AVA-attended St. Louis, going to Cincinnati; IVA
5A32 - IVA local conferences, no ???
5A32 - IVA-goes to their meetings, attends computer workshops
5A32 - Most in-services in ???
5A32 - Moving from woodworking association to broader organizations
5A32 - Nationals too expensive, goes to state conferences
5A32 - No national conferences [2]
5A32 - Regional workshops
5A32 - Seldom attend anything, not a priority
5A32 - State conferences presented at MVA lots of state work with Ken Welty???
5A32 - TSA - National Mon=Local
5A32 - Uses some in one class a lot
5A32 - Went to St. Louis AVA, more local emphasis and orientation. Prefers local craftsmanship organizations
5A41 - Workshops
5A42 - IVA
5A42 - Workshop; F - College classes are mainly bunch of baloney
5A43 - Attend regional workshops
5A43 - IVA, IAEE
5A44 - Illinois drafting teacher meetings
5A61 - ITEA, AVA, IVA
5A63 - Hosting workshop as result of state project, visited Colorado, Wisconsin
5B41 - Attend state conference
5B41 - Has used a couple activities
5B41 - No formal professional plan???
5B51 - ENROLLMENT FULL
5B52 - 3 workshops, develop videos, brochures
5C11 - Go to wood seminar & wood shows
5C11 - Sun Corp. seminar
5C21 - Technical seminars
5D5 - comments-General comments - Attend CAD workshops; 50% of what I do I've gained from the Illinois Drafting Teacher Association - active for 25+ years, prefers organization that focuses on drafting areas
5D12 - Illinois woodworkers
5D32 - GATF
5D32 - Illinois Industrial Education [2]
5D32 - Technology teacher attended ITEA nationally, ???
5D32 - Vocational Training News, School Shop
5D63 - Illinois Electronics Association
5E21 - Except CAD [2]
5E21 - Except electronics
5E21 - Woods Journal, School Shop, Industrial Education [2]
5E22 - School Shop', AVA, Industrial Education
5E31 - Automotive mags
5E31 - Belong to Illinois Vocation Education; Auto CAD, School Shop, Industrial Education
5E31 - Industrial Education, School Shop, Woodworking, Metals Production
5E31 - Looking at trade journals, new equipment, and catalogs
5E31 - Printing Journals, AVA Journal, Technology Teacher
5E31 - Read trade journals only in electrical and drafting areas
5E31 - Reads all professional journals
5E31 - School Shop
5E31 - School Shop, curriculum development materials
5E31 - School Shop, mostly shop stuff
5E31 - Woods magazines (lots of them), gives students extra credit for reading woods articles
5E31 - Workbench, State Periodicals
5E41 - NAIT Industrial Education
5E41 - Takes courses
5E52 - Serves on Illinois Teacher Professional Development
5E62 - Gone to a lot of seminars; wrote article about program
5F31 - Courses in graphics
5F31 - Taken workshop
5F31 - Taking construction technology classes
5F41 - Electronics classes
5F41 - Masters in Counseling
5F41 - Taken IP courses
5F41 - Taking courses [3]
5F51 - Continually good work
5F51 - Has about 30 hours
5F51 - MS=60
5F51 - Pursuing Master's
5F51 - Several, yes
5F51 - Takes classes, NIU
5F51 - Yes [3]
5F51 - Yes - about 6 courses
5F61 - Has master's in education, IT [2]
5F61 - Yes - recently got master's degree in school administration
General comments - taking special education classes, Talks to ISU people when has problem and wants information

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6. Enrollment [Cumulative effect]						
Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
A. Enrollments are stable or increasing	1==6A11	19==6A21 Declined significantly	18==6A31 Declined or no change	28==6A41 No change	27==6A51 Some enrollment increase	7==6A61 Has increased significantly
B. The number of courses (sections) offered	6B11	6B21	6B31	6B41	6B51	6==6B61 New sections added
C. The nature of the students enrolled in the program	6==6C11 Only least able students participate 6C12 Only males	6==6C21 Only males	38==6C31 Primarily males	24==6C41 Some talented participation but mostly normal as always 13==6C42 Encourages females	7==6C51 Actively recruits and is successful in increasing female and minority enrollments	3==6C61 A significant proportion of high-talent students 2==6C62 Has succeeded in recruiting about 50% female and a proportionate minority enrollment

Parallel to the affective domain per Krathwohl et.al.

Characteristics	Active resister	Passive resister	Conservative	Open looker	Early Adopter	True Leader
			Receiving =>	**Responding=>**	**Valuing=>**	**Organization & Characterization**

Interviewee comments with respect to dimension 6. Note the citation codes represent where they would occur in the actual instrument.

6A21 - Very much less capable LD, EMH
6A21 - Why state requirements with respect to H.S. graduation
6A22 - Had been going down, but has stabilized
6A22 - High school enrollments down but that's school-wide
6A41 - Good along
6A41 - Good enrollments;
6A41 - In some courses
6A41 - Pretty stable; General comments - 125 freshman - 180 this year through publicity mailings. Really more interested in TRADITIONAL type program.
6A41 - Very much so; Went from 4 teachers to 1 in the 1980's. Now we have 2+ teachers and hired a teacher at 1/10. 1980's destroyed a lot of programs; a lot of teachers lost job. By adopting the ILL Plan, we are trying to implement a program that has no base. Students are reluctant to be a first-timer. They would be more comfortable taking something traditional Dad or brother took To be successful, we need to blend elemen of ILL Plan with traditional in North?? par IL.
6A41 - Woodworking goes up and down
6A42 - High enrollment
6A43 - Due to schedule, more than new emphasis
6A51 - 3 to 4 years
6A51 - slight
6A51 - This has been because we've gone back to o
6A61 - Especially electronics
6B21 - Decline in school population and academics
6B21 - Enrollments down due to changing entrance requirement - very concerned
6B21 - Enrollments down; more emphasis on course preparation
6B21 - Lost 3 sections
6B31 - No
6B41 - 4-5 sections, 25-30 per section
6B41 - 8 section 12-20 students
6B41 - a section orientation 4 other traditional cour
6B41 - Holding own
6B41 4, 6C32 COUNSELOR HAS BEEN HELPFUL-THEY MAIN STREAM SLOWER STUDENTS. TEACHERS NOT INCLUDED IN THE DECISION MAKING PROCESS-CAUSED SOME RESENTMENT AMONG INSTRUCTORS
6B51 - No lack of students, waiting list to get in.
6B51 - Yes, Principles of Technology
6C2? - Guidance counselors "funnelling" students toward college
6C13 - Poorer student quality
6C21 - Has decreased in caliber
6C21 - no change, not many girls; quality good in drafting, other classes not so good
6C22 - Ability going down
6C22 - Caliber is decreasing - High School Graduation Requirements
6C22 - Declined some
6C22 - Declining
6C22 - Few females; some freshman ??? ???
6C22 - Few girls, quality is a big mix
6C22 - General deterioration
6C22 - Getting better students
6C22 - Getting poorer students - very concerned
6C22 - Getting worse
6C22 - Large number of girls
6C22 - Less able students
6C22 - Less capable
6C22 - Less capable student
6C22 - Less capable students
6C22 - Less motivated
6C22 - Less talented
6C22 - Less talented
6C22 - Less talented
6C22 - Many SN mainstreamed 80% students
6C22 - More girls
6C22 - more females, below average quality
6C22 - Much less able students
6C22 - Much worse
6C22 - No change in number of girls
6C22 - Some decline due to change in academic requirements; worse student quality; behavior ??? handicapped
6C22 - Some years have had good numbers of girls
6C22 - Very much so less talented
6C23 - Occasional female
6C23 - Poor academic??? quality
6C23 - Student ???, not bad some ???
6C24 - unusual school setting
6C31 - Construction
6C32 - 1/2 SN students; General comments - Scheduling is a real problem - kids cannot take a sequential set of courses - 7.9% of the student body. Super contact regarding RC cars
6C32 - Better students, mainly males, about same - 10-12 females a year

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6C32 - Fluctuates
6C32 - Less than before
6C32 - Losing females to agriculture, young and active
6C32 - More in special education
6C32 - No change
6C32 - No change
6C32 - No change, but no high end students
6C32 - Same
6C32 - Same
6C32 - Slight improvement in quality
6C32 - We are losing kids because of increased academic requirement. Last year and this year's numbers are down.
6C41 - 1/2 girls in printing Industrial Arts dropped at junior high. Home Economics. dropped at junior high. General comments - Administrators are trying to dump IA + TE Negative - doesn't see much hope without administrative support and funds.
6C42 - Better than expected to find
6C42 - Filling up the woods classes; few girls - the ones I get are weak???
6C43 - A little of every level.
6C43 - No female growth; same to ??? ability
6C43 - Pleased with present mix, better than in past. General comments - Is making a real effort to try to implement. Further implementation will be dependent upon how the students receive it; seems to be taking a positive ATTITUDE towards it.
6C52 - 30-40% female
6C52 - 140 students out of 750 are enrolled - enrollment is going down because of students being pushed into college-bound. Students are provided very biased brochures by counselor.
6C61 - More women in class-18 to 20 per class
6C62 - 4 girls - 13 in Transportation, 20 in Energy Utilization; General comments - 24 in building trades???, freshman introductory course. We're doing things in high school which should be done in middle school - if we had one. Need to develop middle school program and provide drafting, etc. at high school.
6C62 - Communication
6D61 - B61 - Added second teacher; General comments - When I went from IA to Tech. Education, stayed same for 2 years - has increased over last 2 years; excellent administration support; $91,000 for this year - drafting/communication lab
Cites real problems because counselors single out slower, non college bound students for tech ed. No clear guides in some areas of the plan
General comments - 90% of students go to college. Member of AAAS Project 206 1 Technology Group
General comments - Enrollments declining, whole community population declining, small increase in girls, increased state academic requirements; lower quality
General comments - Just moved to new facility - only been there 4 weeks - off to good start implementing IPITE

Appendix D
Telephone Interviewers

David Boyt, Instructor, Industrial Arts/Technology Department, Pittsburg State University, Pittsburg, Kansas

James L. Barnes, Assistant Professor of Industrial Education, Department of Business and Industrial Education, Eastern Michigan University, Ypsilanti, Michigan

John Iley, Assistant Professor, Industrial Arts/Technology Department, Pittsburg State University, Pittsburg, Kansas

Michael J. Dyrenfurth, Professor of Industrial Education, Department of Practical Arts and Vocational Technical Education, University of Missouri, Columbia, Missouri

Rodney L. Custer, Instructor of Industrial Education, Department of Practical Arts and Vocational Technical Education, University of Missouri, Columbia, Missouri

Appendix E
Supplemental data: Inter-interviewer reliability

One Factor ANOVA X_1: Interviewer Y_1: R1-R6 Means

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
C	18	3.435	1.323	.312
DB	16	4.411	.766	.192
I	11	4.277	1.419	.428
D	45	3.47	.953	.142
B	27	3.423	1.435	.276

One Factor ANOVA X_1: Interviewer Y_1: R1-R6 Means

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
C vs. DB	-.976	.794*	1.485	2.437
C vs. I	-.841	.884	.889	1.886
C vs. D	-.035	.644	.003	.108
C vs. B	.012	.703	3.028E-4	.035
DB vs. I	.135	.905	.022	.296

* Significant at 95%

One Factor ANOVA X_1: Interviewer Y_1: R1-R6 Means

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
DB vs. D	.941	.672*	1.923	2.773
DB vs. B	.989	.729*	1.806	2.688
I vs. D	.806	.777*	1.057	2.056
I vs. B	.854	.826*	1.048	2.047
D vs. B	.048	.562	.007	.167

* Significant at 95%

Note: R_1-R_6 means is an aggregate variable created by calculating the average of each interviewee's rating across the six dimensions of change ratings. The affective rating was not included in this average.

Inter-interviewer reliability analyses excluding Boyt's data

One Factor ANOVA X_1: Interviewer Y_1: R1-R6 Means

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	3	6.753	2.251	1.523
Within groups	97	143.413	1.478	p = .2135
Total	100	150.166		

One Factor ANOVA X_1: Interviewer Y_1: R1-R6 Means

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
C	18	3.435	1.323	.312
I	11	4.277	1.419	.428
D	45	3.47	.953	.142
B	27	3.423	1.435	.276

One Factor ANOVA X_1: Interviewer Y_1: R1-R6 Means

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
C vs. I	-.841	.924	1.09	1.808
C vs. D	-.035	.673	.004	.104
C vs. B	.012	.734	3.711E-4	.033
I vs. D	.806	.812	1.295	1.971
I vs. B	.854	.863	1.284	1.963
D vs. B	.048	.588	.009	.161

Appendix F
Most recent university course taken[1]

A technical course
Accounting (Northern Illinois University)
Administration & supervision of Industrial Arts (University of Illinois), Administration course, internship, principalship, Administration in education (University of Illinois), Educational Administration, Educational Administration, Administration
Anatomy & Physiology
Assertive discipline
Auto CAD, Summer 1986 (Junior College), AutoCAD, AutoCAD course (community college), CAD [9] (University of Wisconsin - Platteville), CAD-Key (Colorado State University), CAD/CAM, Design: Materials
Automotive Technology (Ferris State University), Engines & Brakes
Bargaining in education
CAI
Children at risk
Communication Technology
Computers, Computers, Computer Software Analysis, Microcomputers
Construction Technology
Cooperative Education [7] Cooperative education (Northern Illinois University), Summer 1989, Cooperative Learning, Cooperative learning, COOP classes in Vocational Education, Summer workshop, (Northern Illinois University)
Principles of Technology, Teaching Principles of Technology - pilot teacher
Curriculum, Curriculum development, Curriculum in Industrial Technology
Developing Reading Language, Illinois Plan course
Dissertation Seminar
Drafting course, 5-6 yrs ago (Illinois State University)
Economics, 5 years ago
Electronics, Electronics
Energy & Environment (University of Illinois), Energy course, 4 or 5 years ago, Energy Workshop (University of Illinois)
Exceptional Child, Teaching the L.D. Student
Field service credit, 3 hours screen printing, Field Studies in Industry (Northern Illinois University)
Graphics, Graphics Problem Course (Illinois State University)
History, History, History of Western Civilization
Illinois Plan, Illinois Plan Course (Illinois State University), Illinois Plan course, VIP teaching (Northern Illinois University), Illinois Plan Implementation (Illinois State University) [2]
Independent study, 32mm cabinet building system
Industrial Training, Govern??? State
Leadership Symposium
Managing conflict constructively (St. Xavier University)
Manufacturing, [2], Manufacturing curricula developments (University of Southern Illinois, Northern Illinois University), Production
Photography, 3 years ago (McHenry Com. Col.)
Product & Inventory Control (Indiana State Univ.)
Program Evaluation, Research Methods
Project Teach, Project Teach & Pride, Project Teach, last summer (Northern Illinois University)
Psychology Class (Illinois Teacher Institute)
Readings in Technology (Eastern Illinois University), Issue and Trends of Technology (Eastern Illinois University)
Research Seminar
Robotics
Special Seminar, Graduate Level
Teacher Methods, Teaching methods, Education, Teacher Effectiveness Training
Teachers Expectations in Student Achievement
Technology Update (Illinois State University), Technical Education Illinois Plan, The Illinois Plan (West Illinois University), Workshop on technology, 1978
Vocational Agriculture
Vocational guidance (Illinois State University), Counseling

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[1]Question 3: Name of most recent full university course taken

Appendix G
Courses offered at responding schools[1]

(207 different titles) (352 multiple course listings) (496 course offerings mentioned by respondents)

8th Grd. Orientation/Survey Course [2 – 0.4%]
A self discovery unit
Activities in Technology
Advanced Automotive Technology
Advanced Drafting
Advanced Electronics Technology
Advanced Engines
Advanced Metal Work
Advanced Photography
Advanced Printing
Advanced Small Gas Engines
Advanced Welding
Advanced Woods
Aerospace
Agriculture [2 – 0.4%]
Architectural Drafting I [6 – 1.2%]
Architectural Drafting II [2 – 0.4%]
Architectural Drafting III
Architecture
Architecture & Construction
Automotive (Vocational Project)
Automotive Mechanics I [8 – 1.6%]
Automotive Mechanics II
Automotive Mechanics III
Automotive Mechanics–Entry level
Automotive Orientation
Automotive Service
Automotive Shop
Automotive Technology [2 – 0.4%]
Basic Woodworking
Beginning Drafting
Bench Metals
Building Construction
Building Maintenance
Building Trades [9 – 1.8%]
Cabinet Making
CAD I [5 – 1.0%]
CAD II
CAM
Career Education
Carpentry
Communication [21 – 4.2%]
Communication Graphics
Communication Technology [2 – 0.4%]
Computer
Computer Drafting [2 – 0.4%]
Construction I [5 – 1.0%]
Construction II
Construction III
Construction IV
Construction Technology
Construction Trades
Construction-Trade (Vocational project)
Cooperative Education
Digital Electronics
Drafting & Communications
Drafting I [21 – 4.2%]
Drafting II [4 – 0.8%]
Drafting III
Drafting/CAD I [2 – 0.4%]
Drafting/CAD II [2 – 0.4%]
Drafting/CAD III
Drafting/CAD IV
Electricity I [13 – 2.6%]
Electricity II [2 – 0.4%]
Electronic Printing
Electronics I [16 – 3.2%]
Electronics II [5 – 1.0%]
Electronics III [2 – 0.4%]
Electronics IV
Electronics V
Electronics VI
Energy & Power
Energy I [10 – 2.0%]
Energy II
Energy III
Energy Transportation
Energy Utilization [5 – 1.0%]
Engineering Drafting I
Engineering Drafting II
Engineering Drafting III
Engineering Graphics
Engineering Technology
Exploring Materials & Processes
Exploring Technology
Freshman Survey (Orientation)
General Drafting
General Metals
General Woods

[1]Question 3F: Titles of ITE courses taught at school

Graphic Arts I ..... [6 – 1.2%]
Graphic Arts II ..... [4 – 0.8%]
Graphic Arts III ..... [2 – 0.4%]
Graphic Arts IV
Graphic Arts Processes
Graphic Communications I ..... [3 – 0.6%]
Graphic Communications II
Graphic Design [2]
Home Economics ..... [2 – 0.4%]
Illinois Plan I (Orientation)
Illinois Plan II (Orientation)
Industrial Arts I ..... [5 – 1.0%]
Industrial Arts I: Graphics
Industrial Arts II ..... [2 – 0.4%]
Industrial Arts III
Industrial Arts IV
Industrial Arts Service
Industrial Arts-JHS
Industrial Cooperative Education
Industrial Drafting
Industrial Orientation I
Industrial Orientation II
Industrial Technology I ..... [3 – 0.6%]
Industrial Technology II
Industrial Technology Survey
Industrial Technology-9th grade
Introduction to Applied Technology
Introduction to Communication
Introduction to Drafting ..... [2 – 0.4%]
Introduction to Industrial Technology [2 – 0.4%]
Introduction to Industry
Introduction to Metals
Introduction to Occupations
Introduction to Small Gas Engines
Introduction/
Orientation to Electronics ..... [2 – 0.4%]
Introduction/Orientation to Technl'y [7 – 1.4%]
Introductory Power Technology
Keyboarding
Machine Drawing ..... [2 – 0.4%]
Machine Shop I ..... [3 – 0.6%]
Machine Shop II
Machine Tools
Machine Trades
Machine Woods Technology
Machine Woodworking ..... [2 – 0.4%]
Maintenance
Manufacturing & Mass Production
Manufacturing I ..... [8 – 1.6%]
Manufacturing II ..... [2 – 0.4%]
Manufacturing Technology
Manufacturing-Metals
Manufacturing-Wood
Manufacturing/Production I
Mechanical Drawing I
Mechanical Drawing II
Metal Shop ..... [2 – 0.4%]
Metals I ..... [8 – 1.6%]
Metals II
Metals III
Metalworking
Multishop (for freshmen 9th grade orientation)
Orientation ..... [2 – 0.4%]
Orientation to Automotives
Orientation to Industrial Education ..... [2 – 0.4%]
Orientation to Technology ..... [5 – 1.0%]
Orientation to Television
Orientation-10th grade orientation
Orientation/Introduction to Industrial
Technology ..... [3 – 0.6%]
Painting & Decorating
Photography ..... [3 – 0.6%]
Power ..... [2 – 0.4%]
Power Mechanics I ..... [3 – 0.6%]
Power Mechanics II
Power Mechanics III
Power Mechanics IV
Power Technology I ..... [2 – 0.4%]
Power Technology II
Power Technology III
Principles of Technology (not applied physics)
Principles of Technology ..... [4 – 0.8%]
Printing I ..... [2 – 0.4%]
Printing/communications
Product Engineering
Production I ..... [17 – 3.4%]
Production II
Production III
Production Technology ..... [7 – 1.4%]
Sheet Metal
Small Engine ..... [8 – 1.6%]
Study Skills
Technical Drawing
Technical Education I
Technical Metal Work
Technology & You
Technology & You (for SN students)
Technology Education
Transportation I ..... [25 – 5.0%]
Transportation II
Transportation III
Transportation, Energy & Power
Vocational Automotive Electronics
Vocational Automotives
Vocational Electricity
Vocational Graphic Arts
Welding ..... [9 – 1.8%]
Wood III ..... [6 – 1.2%]
Wood IV
Wood Technology I
Wood Technology II
Wood Technology III
Wood/Woodworking I ..... [27 – 5.4%]
Wood/Woodworking II ..... [7 – 1.4%]
Woods - TMH
Woodworking/Building Trades

Appendix H
Comments about familiarity with IPITE[1]

100% in orientation to tech course, 10% in woods
Actively using portion, manufacturing, mass production
Adapted some
Adapting and teaching from it
Adapting considerably and teaching from it
Approx 50% of my course is IPITE
Attempting to teach from it
Beginning to initiate
Extensively teaching from it
Given text book
Just getting into it
Limited use
More - using outcomes - reviewed it extensively
Not entirely sold on it - take that back, everything is pretty flexible. I'm an old timer and believe in more hands-on and project
Not real familiar with IPITE; teaching from it some
Participated in workshop - Dennis Gallo; doing it to a minor extent
Reconstruct
Some reluctance on part of administration to try it
Starting to use
Teaching from it
Teaching from it a little [3]
Teaching from it a lot
Teaching from it about 1/3
Teaching from it about 33%
Teaching from it in bits and pieces
Teaching from it pretty much
Teaching from it some, Partly [5]
Teaching from it some - modified
Teaching from it somewhat [4]
Was pilot program
Teaching from some parts of it, 40%
Teaching some from it - we tried to use it but stopped
TNT - good publication
Totally adopted by school
Use a dab here and there
Using a little - 10% of it used - a lot done before under a different name, then it would be 50%.
Using it, teaching it as a basic guide
Using parts of it
Worked on developing the plan
Not as familiar as we wish to be
But not teaching it

[1]Question 4: Extent of knowledge of the plan, guides, TNT, etc, general comments

Appendix I
Respondent attitude comments about IPITE[1]

Positive Comments

All right, but there are students missing out. A number of juniors and seniors want to know what happened to drafting. Drafting - you need to know the tool. Believe IL is getting carried away with the technology. Just got a CNC lathe (little) - have 1 per class. Good for a demo and a few kids. Not time for all to operate. Money could have been spent elsewhere.

Appropriate for orientation level

Been involved in curriculum development, automated manufacturing, have used portion of IP material

Better than average; initially misinformed; pushed down our throats by state; turned off; getting better

Between A & B - part of it I like, drawback is that it omit many basic skills

Between A & B - they've helped a lot

Fairly narrow - industrial oriented; positive except for industrial thrust

Fantastic, wish we had more activities, I know they are working on it.

Good - at beginning, there were not enough materials, now there's more material. Better kids like the materials better than slow ones.

Good - certain areas, e.g., communication & production, access to equipment would help; fairly expensive to set up

Good - it works

Good - the IP may hold some potential; some activities are at too low a level.

Good starting point

Good. Not satisfied kids are learning all they need. Some good activities but many don't work well.

IP is excellent, the only way to go, gives kids a base for change

Materials-good; state funding - stinks; they've got good support and information, and research but too many traditional facilities trying to teach it; too tough; takes a while to change; good idea - need help in developing facilities.

Positive Comments

Neutral to okay - a little simplistic

Neutral to positive - using ideas gained from literature - doing best to do what they want

Positive (not very)

Positive - difficult to get kids enthused: kids want more hands-on

Positive - projects are an expected part of the program. Positive on parts - pulling in related areas.

Positive - some units useful (e.g., CO2 dragster).

Positive [3]

Positive, but administration does not support

Positive. Administration and supervisor did not support IP. Hard. IP has been 10 years - it's been long-term effort. It's contributed to the demise of the professional association (IIEA now IITEA). Regionalization is hurting us, things are too far removed. Teachers are demoralized.

Positive; older teachers seem less favorable

See some possibility in them, but not overwhelming

some good ideas, but not accepting totally. Had been negative, now leans toward it.

Somewhat favorable to parts, implementing because required

Somewhat positive to neutral

Uses IP as a guide, very positive, are using the curriculum

Very impressed with concept. Using RC-10 car as concept empowered self is great concept. Implementation is difficult, concept of 4 courses dividing technology is dull. Staff has fought it. Mentioned ill woodworkers' association.

Worthwhile

[1]Question 5: Comments about attitude of respondents about IPITE

Negative Comments

Activities are geared to middle and above caliber of students, we're getting more students from the bottom of the deck. This causes a problem.

Activities are not as concrete ??? step by step guidelines. Older teachers are having a tough time because it is so different.

Between C & E - present a mixed bag; grain of salt

Between C & E - students weren't interested

Between C & E; hard to swallow

Between C & E; Not teaching introductory course this year, moving toward theory of technology; materials are geared too low for high school

Between C & E; The IP is too watered down, not set up to be college prep. Base IP on vocational avocational, and college prep. Currently emphasizes too much vocational in orientation.

Between C & E; We started with IP before it was organized properly; IP is not advanced enough because students in HJS already had it. It seemed a watered-down program compared to our Vocation Education thrust; He sees himself as a vocational educator; schools with success in IP are those without significant commitment and investment in ITE; why trade in a successful unit shop for a watered-down experience?

Biggest objection to IP is that it is too juvenile, doesn't relate to the real world.

Do not believe the materials appropriate for 9-12. They are appropriate for 6th grade - this is not meant to be derogatory statement. Not comfortable with I Plan as it is presently. Many of kids in class are not able to or will probably never be able to do some of these things - students lack preparation. I understand direction but not comfortable with the way it is now.

Don't like it, kids turned off by it, activities are too juvenile, topics fine but don't like all the kids games

For high school it is too basic, too introductory to get students interested; better for JHS/MS; IP is more effective down south (rural); suburban Chicago area is not favorable to IP; those who implemented IP don't find it a significant improvement over existing IE

Negative Comments

He doesn't think IP is a good plan for the types of students he has - he has many special needs students that appreciate the hands-on aspect, 2) There is not enough hands-on, shop-like activity for his kids, 3) Many kids are and will miss out because of the IL Plan.

I like it, but the kids don't. I'm trying to meet the students' needs. Ill plan fits the times, good on paper but kids don't like all the theory. Students at this school get a lot of good out of more traditional programs.

I think they're ok, but my enrollment will be declining because kids don't adjust too easy

I'm too much old-fashioned, some is very good (e.g., insular???)

I've outrun them, gone beyond

Indifferent - students are bored, want to do project work

IP is too generalized, too simplistic, too far removed from vocational education, no skills taught, it is better for the JHS and rural areas

IP seems too much for JHS or for small towns, Mickey Mouse, not sophisticated enough

It won't work. In concept it's good, but it's going in wrong direction, industry wants skill! Too much reading dedicated to vocational education, regionalization of VE has squandered ton of money.

Looks good on paper but doesn't work well with 30 kids. Students do activities but don't have anything to show for it. They like to DO the activities, make things, but don't like the theory. You have to keep all the kids busy. They are trying to modernize IA but hasn't worked all that well.

Many adamant against it

Most are at lower grade level, not sophisticated enough

Most teachers are doing shop work under the disguise of technology

Need them, if i were younger I'd be more enthusiastic, I don't have the energy

Negative - more of 6th or 7th than high school.

Negative - not too happy with IP; some is too elementary; for existing programs; it looks rather rinky-dink. Not hands-on enough contrived activities, lack of student interest

Negative about technology program

Neutral to negative. Sounds good on paper, but very hard to implement; doesn't address basic needs of students, their ability is too low!

Negative Comments

Not geared for high school - mickey mouse, mickey mouse

Not good. Established teachers were skeptical. We were pilot school but still skeptical, especially about transportation

Piloted last year as 9 weeks in each cluster - thought it was not enough time. too limited in H.O. No text book, students turned off. No equipment.

Some good, some bad. Getting away from basics. Too much talk, too little hands-on

The IP is just another name for the same thing; no financing to introduce technology; next to impossible to implement it; nothing wrong with vo-tech the way it has been taught

They need to differentiate between JHS & SHS. Much of it is too juvenile, of late the activities have improved, biggest problem is that these are thinking courses, not memorization.

Wants to stay the same

Neutral Comments

Difficult to get materials, working them in is very difficult, there is a lot of good stuff in there, but it takes a lot of time.

Fit larger schools better than small, urban better than rural

Haven't really studied them, they're probably fine as guides

I teach most of the electronics - materials developed are being used. Colleague teaches orientation - J.J. Demonte is teaching orientation classes. Believes if materials, etc. are on a silver platter, it will be done.

In process of implementing it. not sure its the way to go. so much is too childish. I'm much more vocationally oriented. (this respondent also teachers at a vocational school)

IPITE will knock out IA, would relate better to urban areas

Many teachers are angry about losing their traditional teaching area, it is a very difficult change for many teachers, my feelings are generally fairly positive. its been pushed too fast and hard. I'm really trying but need time to assimilate it. we're trying to make it work

More activities are needed, students with broader background

Note: Did dissertation on the perception of high school principals to the Illinois plan

Some is appropriate, principles of technology is better, but neither IP nor PT should be a stand-alone course

Some positive. Too broad in places.

Some useful aspects - not much implemented; doesn't know enough to feel comfortable with it - would like clearer guidelines, workshops - but enjoy the challenge of new areas

The IP has its place but it is too conceptual. I like skill, I'm not too keen on it. I want to teach woods.

Useable for most part, but they must be selected and adapted

Appendix J
Nature of Orientation Courses' Central Focus[1]

Communication - drafting-related, Production - more than anything. 9 wk
Communication, 3/4 time in Production, 8-9
Communication, 9-10, [5]
Communication, Comprehensive overview course
Communication, Comprehensive overview course, Energy utilization, Production, Transportation, 7-9
Communication, Comprehensive overview course, Production,
Communication, Energy utilization [4]
Communication, Energy utilization, Production, 9-12
Communication, Energy utilization, Production, Transportation, 9-10, [17]
Communication, Energy utilization, Transportation, 9th
Communication, Entrepreneurship, Production, 9th
Communication, Production, 8th [3]
Communication, Transportation
Comprehensive overview (communication, production, energy utilization, transportation), 9th
Comprehensive overview course (as best they can)
Comprehensive overview course (six areas)
Comprehensive overview course - not this year, but last year
Comprehensive overview course [26]
Comprehensive overview course by rotation [2]
Comprehensive overview course, Production
Comprehensive overview course, Production, Transportation
Comprehensive overview course, Transportation
Comprehensive overview course; 8th grade - drafting, woods, metals
Comprehensive overview in Orientation To Technology, not in woods
Cooperative work program, 12th
Design, Drafting, Production, 10-12
Do CAP Rocket, software. Pretty traditional, basically wood shop/drafting/plastic/graphic arts.
Energy utilization - Auto
Energy utilization, 9-12
Energy utilization, Production, Transportation, 9th, [2]
Energy utilization, Transportation, 9-10,
Metals
None [8]
Production [5]
Production manufacturing, 9-10
Production, Transportation
Transportation, 9th, 10-12, [5]
Woods [2]

[1]Question 7C: Describe the nature of your orientation course's central focus

Appendix K
Extent of IPITE utilization and related comments[1]

10% [3]
15%
20%-30% [2]
25% [4]
33% [2]
35% [2]
40%
50% [5
60% [4]
80% [2]
A few activities incorporated into our existing courses
Adapted, more than straight adoption
Attempts to take elements agree with into our program.
Between extensively and some; about 50%
Between some and not at all [3]
Bits and pieces - would like to have a good textbook, maybe.
But I've added a lot [2]
But not a lot [3]
But we now stopped
Energy Utilization - yes, extensively - rough cookie to teach
has not seen the IP materials, would like to attend IP workshop
Just started this year - about 50%
just getting started
Less than 25%
Material too different
More for contest than activities
More than some, use it more as time goes on
Nothing
Only for a pilot
Only the concepts and approach
Plus significant augmentations - about 60% IP. Was a presenter at workshop.
Quite a bit
Some straight, many more adapted
Transportation - small engine books, instead enjoy that class
Tried and dropped program
Try to apply
Used energy modules, some of my own materials were almost like it
User orientation guide plus 90% supplemental last
Uses 50% on average
Very extensive - adapted for use
Very little [3]
Very useful
Went from traditional drafting to CAD - 50%, using course work developed for University of Illinois, keeping in touch with industry is important, this was a result of workshop with people in industry, college professors and business and graduates - and not conventional classes.

[1]Question 7D: Comments about the extent of use of IPITE orientation level materials

Appendix L
Nature of use of IPITE materials/comments[1]

A-Production, a lot of work; D-freshman orientation; E-North central; F-Work with regional director, ???, automatic system
Adapted, Adapted extensively to add more basics [2]
Also as reinforcing tool for academics
As a guideline to curriculum development
Have them but don't use them.
Help prepare student activities
Help with curriculum development
Helped revitalize program and improve equipment; funding not a problem; will help prepare for evaluation this year
Incorporating
Mostly to update [2]
Not much, Nothing, Don't use them [16]
Nothing recently
Provide direction
Teach the units in the guides, but augment
To develop material use where can
Use as supplement to my own activities
Use to build curriculum
Used activities of high tech
Used for background information
Used one idea
We are not reluctant to change if we feel it strengthens our program. Students are primary.
We've got all teachers to attend some IP workshops

[1]Question 7E comments about participant use of IPITE materials

Appendix M
Comments about the quality and utility of the IPITE orientation level materials[1]

1st came out-were not modified. Revisions are real good; good hands-on activities; last 3 years - good activities
About 50% useful
About right, maybe a little simple
About right level. They're ok
All right. Yes, useful. More appropriate for middle school, at high school job skills important.
Average
Disagree with philosophy
Does not support existing program
Empowered self-concept is great
Excellent [5]
Excellent job on researching and developing. Evaluation of individuals in a group is very tough. Useful - but require a very broad background for students to use (e.g., students need to know how to use calipers before they can do activity). . Activities we set up like a college class but we are dealing with 13 year olds with different attitudes, etc. Value isn't perceived in student.
Excellent student rapport
Excellent to adapt
Fairly well-done - correct level for junior high
For the most part useful, some are too deep for the students
Generally helpful materials [2]
Good [3]
Good materials, but not teaching them
Good student response, but they want more shop-oriented. Very useful.
Good when using them
Good materials, not enough of them, I use lots of other materials to help supplement these IP guides
Good, but kids don't seem to like it. Useful to an extent - CO2 car is a hit.
Good, particularly with some adaption; they were useful
Good; useful [2]
Great
Guide activities are much too elementary, need more high technology activity
Guide not used as much - just parts
Have no idea
Haven't used them
Helpful
It is new this year, so far student reaction is positive
It's social studies
Just book learning
Kids like them - Rockets, CO2 cars, bridge, mousetrap, winds
Like the activities - with a lot like that you can pick and choose
Looks too elementary; mixed emotions
many activities are useful, others must be modified
Marginal
Materials are great, you can't use all but you can take what can be done
Mixed - fairly low level; should be upgraded [2]
Mixed, 50/50 interest, question of relevance
Most are excellent
N/A [4]
Not appropriate
Not at all [2]
Not enough hands on, too low level, rinky dink
Not sophisticated enough. Most targeted to lower age group.
Not tried
Not useful
Not using the activities
Not interesting
Ok for little kids, JHS
Ok, but I'm not into it.
Okay [3]
Okay; somewhat useful
Only good if you have bright kids
Only one idea I've used
Pretty good - activities a little juvenile-jr. high; depends on where you go
Pretty good; useful about freshman level
Questionable
Robots and electronics and manufacturing, cars

[1]Question 7F: How good are the IPITE materials? Were the activities useful?

Satisfactory
So so
Some may work, just phasing in now
Some students liked it, many, however, wanted projects to take home.
Some students think they're elementary but when they get into it they find out otherwise
Some were useful
Some, teaches advanced level so many activities do not apply
Step by step doesn't work
Students deem transportation activities neat, they enjoy competition and design
Students like it, variety, relevance
Students like the activities, more than wood
Students like them, especially after adapting
Students would like more hands-on
The ones I was doing were already useful.
The students like it, seniors are wanting to go back to do newer activities they missed.
The whole range of responses. Need considerable adaptation.
They enjoy them, some activities are tedious.
They worked
They're hitting at about the right level
Too elementary, not challenging enough
Too few
Too juvenile, wouldn't interest student
Too Mickey Mouse
Too broad and varied, need to be more in-depth
Useful
Useful activities, tend to be on low side, a little juvenile
Very useful
Very good - most of the activities were useful. It depends on the kids and chemistry of the class.
We incorporated concepts, not materials per se
Yes - those geared toward high schools
Yes, useful [3]
Yes, useful, but not extensively

Appendix N
Comments about the value of the *TNT* newsletter[1]

A lot of value. Reviews of software, contacts you can obtain are very helpful. The right length.
Always has usable project or idea
Do not receive it [7]
Don't know
Enjoy it!, worthwhile/helpful [2]
Excellent [5]
Get it, is of some value
Get it, okay
Get, activities and software section
Get, scan [2]
Good [5]
Good, well received, contains something for everyone
Great, had an article published about what he's doing
Haven't heard of it
He gets is, useful
Heard of it [2]
Helpful
I read it and enjoy it
I read it but it doesn't excite me much
If I have time read, Indifferent about it
Information, interesting reading. Some ideas I'm using and going to use - good publication. Timely - ISU.
Interesting and helpful
It helps
It's O.K., interesting
It's okay, gives state perspective, good activities
Like it ???; reads it
Like it a lot, good material
Like, especially computer ratings and activities
Looks forward to it, incorporated some ideas
Newsletter received, keep you updated
No real use for vo-tech
None, Not used [7]
Not bad, have used parts
Now and then something useful
Of little use
Okay - some good, Okay [7]
Okay but not using it
Pretty good
Pretty good; good project/software/information
Read it if have time - off deep end
Read it, get good ideas, its ok [2]
Scan it, some use
Seen it - software version
Some value, Uses it [3]
Some, yes every so often - shows other perspective
Something of value for most people
Traditional IA have an identity, been around - people can relate. To say it is totally inappropriate is a false assumption. There needs to be a blending of both IA and IL Plan.
Tremendous - beautiful piece of work. Information is useful, good product information
Useful activities [2]
Valuable because of software; keeps updating
Very good material, is one of the few that I read regularly
Very helpful for sources and activities, state perspective.
Very useful, Valuable [6]
Very valuable, good activities and ideas, updating, last curriculum was on front cover, will host telecommunication
Very valuable, has contributed to it
We get it [2]
We get it, not particularly useful
We get it, very useful, good information
We read it every time, enjoy, not sure of usefulness
Yes - activity
Yes - good ideas in the newsletter (e.g., mousetrap car), very important-good motivation [2]
Yes I get it. It is excellent, the activities they include are the best part
Yes they get it, somewhat useful, a positive reaction
Yes, informative, good, they get it, it is useful [4]
Yes, interesting, perspectives and updates, worthwhile [2]
Yes, just scan it [2]
Yes, like it all, one of best journals, geared exactly to us, hands on emphasis helps
Yes, no comment [3]
Yes, not much value
Yes, software column is useful
Yes, software review is very good
Yes, TNT, scan it, use plans for activities, computer update is good

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[1]Question 7G: What value is the *TNT* newsletter?

Appendix O
Barriers to progress comments[1]

$ are NOT the problem, although equipment is still a problem.
99% state High school graduation requirements and college entrance, academic competition to get kids into good colleges.
1-Salesmanship is needed with parents; 2 - Get better class of students
1-Talked about it, possibly restructure when go to high school. 2-Facilities problem. 3-Quality of student when working with theory. 4-Graduation requirements are hurting program-many students aren't college-bound but forced that way.
A lot of students not ready to deal with technology; need more activity-based
Ability to recruit
Access to computers
Administration; Administration, lack of support; Administrative resistance; Administrative support; Administrator view of field; Administrators not wanting to throw out the shop [6]
Attitudes of teachers of TE
Awareness of teachers
Awareness of value
Biggest concern. School-industry relationship. Support of local people and industry concerns broad concepts v. specialized skill.
Board commitment
Budget problems of system (actually priorities), equipment cost and updating, High school graduation requirements fewer electives, school board, lack of understanding
Caliber of students
Cannot learn materials as quickly as things change, not educated in areas teaching(electronics, robotics, etc), inservice training would be helpful
Change in academic requirements (High school graduation requirements)
Changing attitudes of teachers and administrators [2]
College bound entrance requirements; College bound students do not have time to take electives, so most TE students are the slower learners; College bound tracking; College orientation of schools, High school graduation requirements; College requirements; High school graduation requirements; High school graduation requirements, too little time to electives, enrollment [14]
Cost of equipment
Counselor misinformation; Counselors - he's a basketball coach; Counselors, scheduling [3]
Deciding what equipment
Declining enrollment, college bound have too few electives; Declining enrollment, High school graduation requirements prevent enrollment; Dropping enrollment - college-bound students not taking electives; Enrollment decline [8]
Departmental and district administration
Difficulty of getting equipment and money
Disagree with philosophy
Discipline
Disillusionment
Doing away with Auto Shop and Wood Shop, converted to weight room and loading dock
Don't know direction kids are planning to go
Don't see too many
Dumping ground
Duplicate physical science curriculum
Educating administration to importance
Finances; Financial constraints; Financing-administrative cuts; Funding; Funding on state level [12]
Freeing up student time to take IE. Competition from college prep curricula
Geared for more capable student
General negative impression of IA/IT
Getting teachers to participate
Higher academic standards - high than state
Increase in math and science
Increased academics

[1]Question 7H: What are the barriers to progress (towards further implementation of TE) as you see them?

IP folk should listen to what people at meetings are telling them; there is a need for more sophisticated activities; the lack of student enrollment; High school graduation requirements
IPITE doesn't work in all schools.
Kids take more pride in individual projects - difficult to assign grades
Lack of a computer room
Lack of administrative support [2]
Lack of computer
Lack of enrollment [2]
Lack of equipment [2]
Lack of funding [7]
Lack of funding - it would be great to have program of technology. you can't teach a lot of courses (e.g., machine shop) out of a ??.
Lack of funding for major equipment
Lack of funds for equipment
Lack of knowledge
Lack of money (budget cuts)
Lack of money for equipment and curriculum materials
Lack of money for equipment, updating, computer
Lack of money, equipment is hard to get
Lack of space [2]
Lack of time; Lack of time to organize and prepare; Lack of time to plan; Lack of time to prepare and get started; Lack of time, being only ITE teacher [5]
Lack of training of teachers.
Lack of weighting of ITE v. other courses
Lack of communication with local community and parents, they need to know alternatives
Learning and implementing a new program
Low enrollment
Low level of students
Mainstreamed students in Vocational Education
Middle school - general education - not designed for vocational technical, etc. A lot is being exposed to kids in science. Middle school kids project-oriented - they aren't concerned about all the background information and theory.
Misconception as to what it is on part of public and counselors
Misconception of administration
Money (lack) [5]
Money - financing
Money - materials/equipment have very little money. If I had the money, I could provide enough to interest students more.
Money - workshops have helped; carrots help. Need to emphasize the positiveness of it rather than the scariness that some ???. Workshops and curricula development should continue; schools need to be willing to invest.
Money for equipment
Money for materials and equipment
Money for updating equipment
Money problem,
Money, getting expensive as you get more advanced
More direction on upper material - not specific enough
My own knowledge of technology
Need for teacher updating
Need new textbooks
New college requirements (High school graduation requirements)
No barriers [8]
No district encouragement for program
No grant funds
No money to make change
Not asked [2]
Not enough hands-on
Not much holding us back other than our being sure what directions to pursue
Not really
Not sold on IL Project
Only seven period day, high school graduation requirements
Orientation program set up in traditional usage
Our size, money for equipment and materials
Overall enrollment decline
Panic with change
Parent's attitude - increased academic
Perceived equipment cost
Poor undergraduates
Public resistance, guidance counselors
Regionalization has destroyed industrial
Release time
Resources [2]
Restructure of curriculum
Restructuring with new titles has helped.
Shortage of teachers
Shrinking and unstable staff
Some resistance of established faculty
State board of education and state commissioner
State support $ are not there
Student caliber is too low
Student enrollment declines

Substantial enrollment drops after each change to IPITE, therefore we quit. Students have limited time available. IP is not required by state. Elementary and junior high school don't have kids explore careers. Regionalization is baloney
Superintendent
Superintendent, reorganization [2]
Taught in old shop areas by old people - just a name change
Teacher burnout, IP is lots of work
Teacher resistance; undertrained
Teachers need to learn to change
Technology upgrading seminar needed, with respect to IP teacher attitude; most staff don't want to do it
The IP has been forced down our throats, too much relearning to do to change
Time off to attend workshops - have to take our time
Time shortage to learn and develop more materials about what's needed most
Time to attend classes and seminars
Time to prepare, some $ problems but these aren't major. More acceptance by academic areas of school.
Time to start up program, new High school graduation requirements
Too few electives and time
Too short - too / not enough listening to teachers
Vocation Director did not let us get together; administration is not favorably inclined to anything vocational or technology; students don't know terminology
We're just getting started. It will depend upon how the students receive it. Attitudes of the instructors.
What barriers? Only to those who see barrier
When teachers follow guides too closely
Willingness to change
Word of mouth

APPENDIX P
Helpful factor comments[1]

A new attitude & experience
A new computer lab
Activities [2]
Adaptable to school population
Administration support and willingness; Administrative support and money [2]
Alternatives to academics
Ambition, competition among students, administrative support
Any kind of communication with other schools & teachers
As a guide great
Association with business & industry people
Attending CAD seminars of regional vocational office; Attending seminars-technical [2]
Backing by administration - rapport
Being pilot school
Bringing together teachers to share ideas, projects.
Can't think of anything that has done much to improve it at my school. The program has to go.
Changed course titles to appeal to college-bound and counselors.
Committed faculty
Communication guide
Community support
Computers [2]
Cooping with other schools
Couldn't single out any single factors - has good funding
Curriculum guides; Curriculum materials; most applaud once they are understood - dealing with stereotypes [2]
Department inherited special education classes that generated extra money and flexibility
Diversity of the program - being able to introduce diverse things.
Dr. Loepp, the ISU course
EIU helped with production technology
Enthusiasm of instructors
Excellent as a guide
Excellent teachers, industry-oriented
Flexibility, allows student to direct training
Good colleagues, working together; Good teachers [2]
Good principal; Great principal [2]
Grant writing skills
Guidance counselor support
Guides have been useful; New curriculum guides [2]
Help from the universities and state department
Hometown boy known in the community
Illinois Plan has contributed, but it is not doing it
Illinois Plan has helped broaden perspective, Illinois Plan helped put information into perspective, Illinois Plan material [4]
Illinois state people who put on workshop are super; great SA ??? area vocational organization is really helpful; booklet of activities and they UPDATE it! Free!
Illinois VIP program
Implementing CAD; VICA
Improvement in administration
Industrial contact
Information from guides, textbooks
Input from local industries [2]
IPITE materials
ISU classes, video tapes
Keeping schedule to 5 period day, keeping class size to 20 maximum
Loepp's and Welty's activities
Look at geographical location - visiting with people in industry as to needs - interactive. They help supply new things.
My own commitment and energy, continual recommitment, computers, other faculty colleagues
National conferences, workshops
New ideas - would like to see better movies (current ones outdated)
New textbooks coming out, material & equipment packages, video programs, state workshops, new Heartland directors
Not asked [3]
Not much to identify - my experience [2]
Nothing [4]
Nothing that I can think of other than the workshops
Nothing. We're going downhill
Other teachers and school administrator
Perkins fund money
Personal effort

[1]Question 71: What has been the most helpful thing to you in enhancing the quality of your program?

Principal's leadership
Proximity to ISU. Faculty on campus a big help. Ken Welty - personal friend and helps a lot.
Publicity around technology in general
RC model cars
Refurbishing equipment and tools to working condition
Regional technology program loans out computers/software
School board is supportive
Selected by state board to present.
Seminars have been excellent
Shift to technology
Software
Some funding tied to it
Some industry help
Some new equipment and budget
Special Education support
State funding via Vocation Education system
State money
Student attitude; Student interest in automobile; Student interest in sophisticated, in-depth, courses; Student word of mouth [4]
Supplemental textbooks
Supportive administration and board
Supportive district and administration
Switch to technology because administration and counselors deem this is the right move
Teamwork of department and activities
The brighter students, occasional lack of discipline problems.
The guides and updating
The IP information and workshops were very valuable
The IPITE has been useful as a lever to broaden the program to shift to technology. Comprehensive degree.
The kids keep you going
The system's technology director
The use of the computer has been exciting to kids
The workshops and courses offered
TNT [2]
Traditional materials [2]
Traditional viewpoint
Use materials in guides
Videos, Bergwall series on technology, T.V. videos
We haven't moved much, nothing
Willingness to purchase new wood equipment
Word of mouth, program reputation, Word of mouth among students, kids like it (my existing program) [2]
Workshops; Workshops - interaction with other teachers; Workshops help greatly in changing attitudes, more concrete examples; Workshops that are available [6]

Appendix Q
Overall correlation matrix of variables

With categorical data

Correlation Matrix for Variables: X_1 ... X_{15}

	Intervie...	R1-Prog...	R2-Meth...	R3-Facil...	R4-Exte...	R5-Prof	R6-Enroll	Affective
Intervie...	1							
R1-Progr...	-.138	1						
R2-Meth...	-.18	.887	1					
R3-Facili...	-.207	.746	.792	1				
R4-Exter...	-.171	.749	.799	.745	1			
R5-Prof	-.092	.72	.734	.681	.755	1		
R6-Enroll	.089	.473	.513	.509	.501	.455	1	
Affective	.014	.741	.787	.686	.753	.748	.548	1
Yrs Tchng	.012	-.183	-.196	-.208	-.182	-.147	-.186	-.239
School Size	.111	-.165	-.109	-.037	-.081	.073	-.265	-.032
Sample T...	.098	-.316	-.255	-.266	-.321	-.357	-.321	-.284
R1-R6 M...	-.145	.902	.931	.882	.89	.849	.653	.833
Age	-.001	-.212	-.217	-.253	-.229	-.211	-.252	-.289
Recode of...	.115	-.282	-.21	-.137	-.186	-.029	-.309	-.105
Recode of...	.003	-.252	-.286	-.304	-.272	-.181	-.28	-.342

Note: 17 cases deleted with missing values.

Correlation Matrix for Variables: X_1 ... X_{15}

	Yrs Tchng	School S...	Sample ...	R1-R6 ...	Age	Recode o...	Recode o...
Yrs Tchng	1						
School Size	.195	1					
Sample T...	.111	.163	1				
R1-R6 M...	-.215	-.108	-.354	1			
Age	.907	.152	.186	-.266	1		
Recode of...	.157	.916	.224	-.221	.143	1	
Recode of...	.797	.172	.126	-.307	.895	.149	1

Without categorical data

Correlation Matrix for Variables: X_1 ... X_{11}

	R1-Prog...	R2-Meth...	R3-Facil...	R4-Exte...	R5-Prof	R6-Enroll	Affective	Yrs Tchng
R1-Progr...	1							
R2-Meth...	.887	1						
R3-Facili...	.746	.792	1					
R4-Exter...	.749	.799	.745	1				
R5-Prof	.72	.734	.681	.755	1			
R6-Enroll	.473	.513	.509	.501	.455	1		
Affective	.741	.787	.686	.753	.748	.548	1	
Yrs Tchng	-.183	-.196	-.208	-.182	-.147	-.186	-.239	1
School Size	-.165	-.109	-.037	-.081	.073	-.265	-.032	.195
R1-R6 M...	.902	.931	.882	.89	.849	.653	.833	-.215
Age	-.212	-.217	-.253	-.229	-.211	-.252	-.289	.907

Note: 17 cases deleted with missing values.

Correlation Matrix for Variables: X_1 ... X_{11}

	School S...	R1-R6 ...	Age
School Size	1		
R1-R6 Means	-.108	1	
Age	.152	-.266	1

Appendix R
IPITE and related documents reviewed

IPITE materials

_____. (1982). *Illinois Plan for industrial education: Communication system.* Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

_____. (1982). *Illinois Plan for industrial education: Energy utilization system.* Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

_____. (1982). *Illinois Plan for industrial education: Production system.* Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

_____. (1987). *Illinois Plan for industrial education: Technology learning activities packet FY 1987.* Normal, IL: Illinois State University, Department of Industrial Technology.

_____. (1989). *Technology education curriculum guide.* Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

_____. (1989, July). *Industrial technology orientation guide.* Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

_____. (n.d.). An internal evaluation and revision of the Illinois Plan for Industrial Technology Education orientation curriculum guide. Normal, IL: Illinois State University, Department of Industrial Technology.

_____. (n.d.). *Quality features for industrial education programs: A guide designed to enhance and support the Illinois Plan.* Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

_____. (n.d.). *Sex equity guide for industrial education programs.* Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

_____. (n.d.). *Special needs guide for industrial education programs.* Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

_____. (various). *TNT.* Normal, IL: Illinois State University, Department of Industrial Technology.

Loepp, F. (1983, June). Illinois Plan for industrial education: Final report FY 1983. Normal, IL: Illinois State University, Department of Industrial Technology.

Loepp, F. (1984, June). Illinois Plan for industrial education: Final report FY 1984. Normal, IL: Illinois State University, Department of Industrial Technology.

Loepp, F. (1985, July). Illinois Plan for industrial education: Progress report FY 1985. Normal, IL: Illinois State University, Department of Industrial Technology.

Loepp, F. (1986, July). Illinois Plan for industrial education: Progress report FY 1986. Normal, IL: Illinois State University, Department of Industrial Technology.

Loepp, F. (1987, July). Illinois Plan for industrial education: Progress report FY 1987. Normal, IL: Illinois State University, Department of Industrial Technology.

Loepp, F. (1988, July). Illinois Plan for vocational education: FY 1989 final report. Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education. OS-IO-154

Loepp, F., & Gallo, D. (1989, July). *Illinois Plan for industrial technology education: Learning activities FY 1989*. Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education. PT-IO-154

Loepp, F., & Gallo, D. (1989, November). *Illinois Plan for industrial technology education: Transportation technology curriculum materials FY 1990*. Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education. PKAC22D.

Loepp, F., & Welty, K. (n.d.). *Illinois Plan for industrial education: Exploration curriculum development initiative*. Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

Loepp, F., Welty, K. et al. (1987). *Exploring technology and the future*. Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

Non-IPITE materials

_____. (1986, June). *Technology education: Production systems*. Grades 9-12 systems block course. Albany, NY: The University of the State of New York, The State Education Department, Division of Occupational Programs.

_____. (1987). *Indiana industrial technology education curriculum: Manufacturing materials and processes*. Indianapolis, IN: Indiana Department of Education.

Bowers, D., et al. (1987). *MAVCC Exploring technology education*. Stillwater, OK: Mid-America Vocational Curriculum Consortium.

Iley, J., et al. (1987). *MAVCC Exploring manufacturing technology*. Stillwater, OK: Mid-America Vocational Curriculum Consortium.

Miller, F.M., et al. (1987, August). *Arizona manufacturing technology: Teacher's curriculum guide*. Flagstaff, AZ: Arizona Center for Vocational Education.

New York State Education Department. (1988, January). *Technology education book 1*. Draft. Decatur, GA: V-TECS.

APPENDIX C

Futuring Committee Report

The Illinois
Plan for Industrial
Technology
Education

Illinois
State Board of
Education

Department of
Adult, Vocational
and Technical
Education

Futuring Committee Report:

Industrial Technology Education

Futuring Committee Report:

Industrial Technology Education

The development of these materials was made possible through a grant from the Illinois State Board of Education, Department of Adult Vocational and Technical Education, Research and Development section.

The Illinois Plan for Industrial Technology Education
Futuring Committee Report: Industrial Technology Education

Illinois State Board of Education

Department of Adult, Vocational and Technical Education

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FUTURING COMMITTEE REPORT: INDUSTRIAL TECHNOLOGY EDUCATION

Introduction:

In 1978, the first meeting of Industrial Joint Staff met in conjunction with the Illinois Industrial Education Association annual conference. At the meeting representatives from each of the seven Universities and Illinois State Board of Education, Department of Adult, Vocational, and Technical Education Curriculum Consultants came together to discuss the future of Industrial Education in Illinois. As a result, the group agreed that high priority should be given to the development of a new State Guide for Industrial Education.

From that moment on, curriculum has been changing in Illinois. For the past decade, the Illinois State Board of Education, Department of Adult, Vocational and Technical Education has funded a comprehensive study and revamping of industrial education. Throughout the 1980s, a technology orientation curriculum guide was developed and later revised. Technology-based orientation curriculum materials were developed and pilot tested. Over one hundred twenty dissemination and implementation workshops were conducted. In 1985, a statewide newsletter (Technology News Today) was established and sent to over three thousand teachers and administrators four times a year. The newsletter established a means of communicating curriculum and professional development activities. In addition, the past decade has brought educators other curriculum improvement initiatives like Education for Employment (EFE), Principles of Technology, Applied Mathematics, Applied Communications, Applied Biology, Applied Curriculum in Technology (ACT) and Tech Prep.

Subsequently, many exploration, orientation, and vocational teachers have utilized these materials in improving their industrial education programs and moved toward a technology-based curriculum. Despite the efforts of the '80s many questions remain, and new ones arise. What impact will the new Carl Perkins legislation have on industrial education in Illinois? How can we utilize and expand the curriculum movements of the '80s into one articulated comprehensive K-adult program? What educational skills will students in the '90s need to be productive in the world of work in and beyond the year 2000?

As the 1990s began, it was clearly time to evaluate the past and plan for the future. Therefore, a "Futuring Committee", representing all levels of education, was established to meet and address this challenge.

Purpose:

The purpose of this report is to review the Illinois Plan for Industrial Technology Education curriculum initiative of the 1980s and revive efforts to develop a comprehensive plan for industrial technology education for grades kindergarten through adult. The committee report will identify objectives for four education levels: awareness (K-5), exploration (6-8), orientation (9-10), and preparation (11-adult). The report will also suggest strategies for curriculum and professional development and public relations activities. Additionally, the committee's report will establish a timeline, identifying short, medium, and long range goals with suggestions for periodic evaluation.

THE ILLINOIS PLAN FOR INDUSTRIAL TECHNOLOGY EDUCATION: K-ADULT (IPITE)

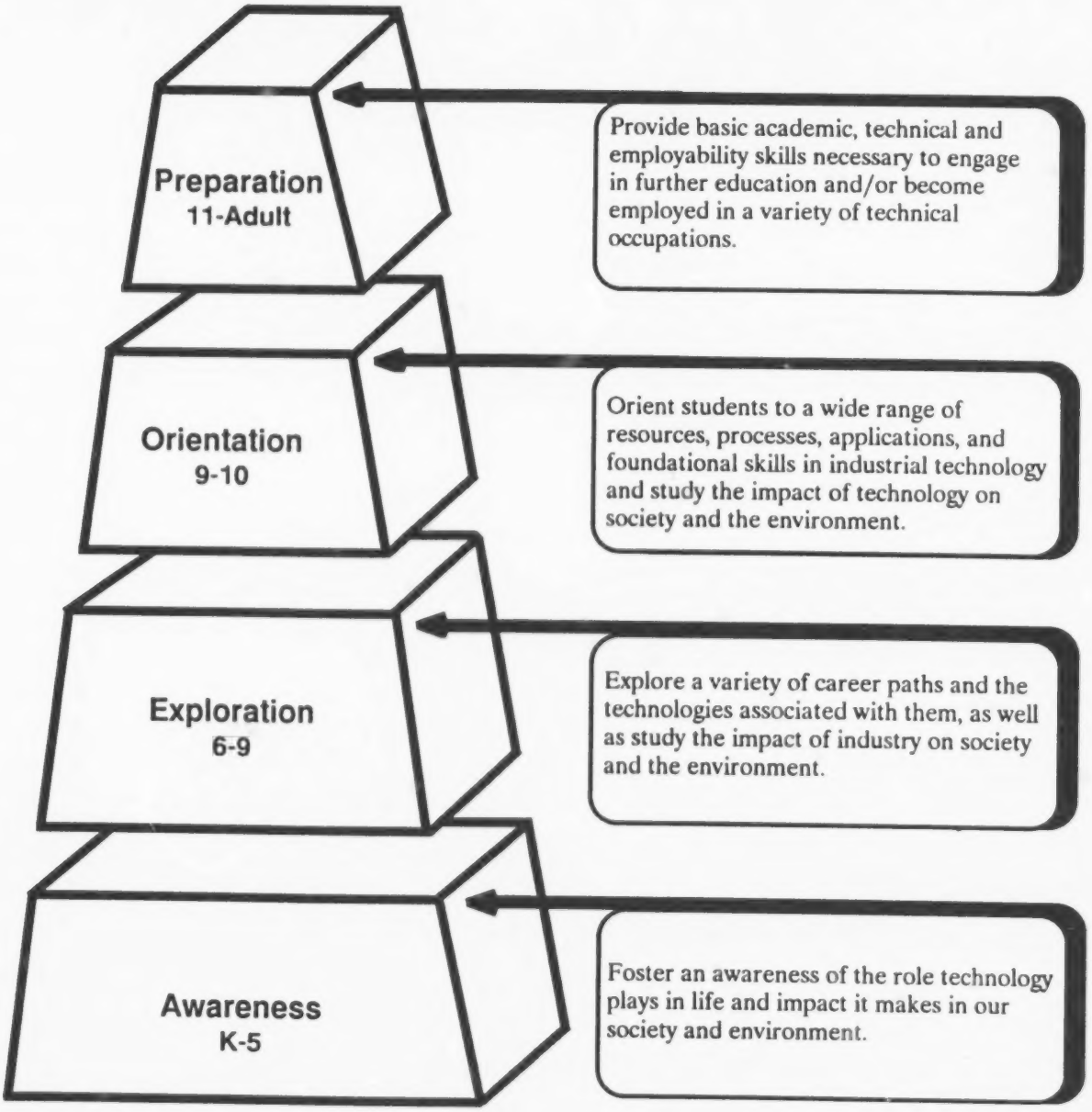
Initiative Goal:

Initiated in the late 1970s and implemented throughout the 1980s, the Illinois Plan for Industrial Technology Education Project (IPITE) was designed to be a K-12 curriculum for Industrial Technology Education in Illinois. IPITE curriculum initiatives focused on the educational levels of exploration (e.g., Exploring Technology Series, ACT), Orientation (e.g., Communication, Energy Utilization, Production, Transportation), and Preparation (e.g., Education for Employment, Applied Academics, Manufacturing Technology). Still, many teachers and administrators identify the IPITE primarily with the orientation curriculum materials. The Futuring Committee hopes to redirect attention toward the goals and objectives for all IPITE educational levels and reemphasize the mission of the IPITE to develop a K-Adult curriculum for Illinois Industrial Technology Education. The IPITE has the following goal:

* to help students become technologically literate and equipped with the necessary skills to cope with, live, and work in a highly industrial/technological society.

In the paragraphs which follow, the report will identify objectives and discuss strategies for curriculum and professional development, public relations, implementation, and evaluation for the educational levels of awareness (K-5), exploration (6-8), orientation (9-10), preparation (11-Adult).

IPITE CURRICULUM MODEL


Preparation
11-Adult
Provide basic academic, technical and employability skills necessary to engage in further education and/or become employed in a variety of technical occupations.
Orientation
9-10
Orient students to a wide range of resources, processes, applications, and foundational skills in industrial technology and study the impact of technology on society and the environment.
Exploration
6-9
Explore a variety of career paths and the technologies associated with them, as well as study the impact of industry on society and the environment.
Awareness
K-5
Foster an awareness of the role technology plays in life and impact it makes in our society and environment.

AWARENESS

Introduction:

The Awareness level of IPITE encompasses grades Kindergarten through fifth grade. Past efforts have done little to impact or affect change at this level. Therefore, new initiatives must include technology education at the awareness level. Developing technology-based materials at this level will 1) build a foundation for establishing technology education as a vital and integral part of the general education of all students; 2) provide a basis for enhancing and strengthening efforts underway at other levels; and 3) give Illinois the opportunity to provide leadership by developing a model program for the nation.

Curriculum efforts at the Awareness level should focus on achieving the following objectives:

1. to help all students foster an awareness of the role technology plays in their lives and the impact on our society and environment.

2. to help students achieve the Suggested Learning Outcomes that are necessary for their continued educational development.

Since Illinois does not offer elementary technology education, curriculum efforts should be directed toward integrating the study of technology and technology-based activities into existing courses. Curriculum developers should review Illinois Suggested Learner Outcomes for each grade from kindergarten through fifth grade. In addition, developers should review national studies and reports such as:

* the National Science Board Commission On Precollege Education in Mathematics, Science and Technology, Educating Americans for the 21st Century: A plan of action for improving mathematics, science and technology education for all American elementary and secondary students so that their achievement is the best in the world by 1995.

* National Research Council, Everybody Counts.

* National Council of Teachers of Mathematics, Curriculum and Evaluation Standards for School Mathematics.

* American Association for the Advancement of Science, Project 2061: Science For All Americans.

* Mission 21

Using the learner outcomes and other key concepts as a guide, a series of Technology-based Learning Modules (TLM) should be developed for each grade, kindergarten through fifth. Each TLM should:

1. directly enhance or reinforce the student's understanding of the role technology plays in today's society.

2. be supported by clearly defined objectives which are directly linked to learner outcomes and/or technological concepts.

3. be articulated so that each grade, kindergarten through fifth, will build on the knowledge and experience gained at earlier grades.

4. provide students with experiential, hands-on learning experiences with technology.

5. utilize low-cost, low tech, easy-to-obtain materials.

6. be designed to be easily integrated into existing programs.

7. be interdisciplinary in nature.

8. be "user friendly," meaning all materials should be packaged in an easy to use and easy to understand format.

Professional Development:

Once the TLMs are developed, a tremendous need for inservice and staff development will exist. Professional development efforts should initially focus on the following:

1. introducing teachers and administrators to the TLMs and activities.

2. providing teachers and administrators with the concepts and content supporting the TLM.

3. giving teachers and administrators hands-on experience in using the TLMs.

Professional development activities should be planned around local, regional, and state conferences involving elementary teachers and administrators. In addition, extensive inservice should be planned and delivered through contractual agreements. As part of the expanded inservice, teachers should explore the philosophy behind the activities, learn innovative instructional techniques (simulation, role playing, simple problem solving, cooperative learning, modeling) and investigate TLM implementation strategies. Since it is important for each inservice to be consistent, a committee representing DAVTE representatives and industrial technology education instructors from each State University (e.g., Industrial Joint

Staff) should collaborate to design the inservice. Once designed, each university should be available to deliver inservice for their geographical region. The inservice should be reviewed and revised on a periodic basis. Awareness level professional development activities should be coordinated through organizations such as DAVTE, Regional Systems Directors, and State Universities.

Public Relations and Marketing Strategies:

Technology education initiatives at the Awareness level will be new to teachers and administrators. Therefore, the development of effective public relations and marketing strategies will be critical to the acceptance and successful implementation of the curriculum. Strategies for marketing the series of Technology-based Learning Modules should include:

1. Pamphlets outlining the awareness level mission, goals and objectives. Two types of pamphlets should be created; one directed toward the teachers and one directed toward the administrators.

2. Presentations at local, regional, and state conferences involving elementary teachers and administrators.

3. Establishing model program sites. The sites should be used to provide staff development and inservice as well as a place to highlight the curriculum to teachers, administrators, parents, and news media.

4. A video tape or series of video tapes directed toward target audiences such as colleagues, counselors, administrators, parents, students, etc., highlighting technology education in Illinois. The video(s) should discuss the philosophy behind technology education and explain the curriculum. Further, the video(s) should show quality teachers, programs, and activities in action. Copies of the video(s) should be made available on a cost-recovery basis.

5. Expand efforts to get students involved in statewide competitive events (e.g., Invent America, student organizations, technology fairs).

Awareness level marketing activities should be coordinated through organizations such as DAVTE and Regional Systems Directors.

EXPLORATION

Introduction:

The Exploration level of IPITE includes grades sixth through eight. Earlier curriculum initiatives (e.g., Exploration Series) have provided little support to the exploration level. With only approximately 20% of the junior high/middle schools in Illinois offering industrial education, efforts to effect change have been limited. The Exploration series was designed to be a set of twenty-four learning packets. The learning packets were to provide students an exploration experience in the content areas of Communication, Energy Utilization, Production, Transportation, and the Impact of Industry and Technology. Though all twenty-four were partially developed, time and funding limited the full development and implementation to only ten packets. In addition, since very few schools had an Exploration level course, much of the content and activities were modified and used at the orientation level. Consequently, teachers have had trouble determining the curriculum difference between exploration and orientation technology education.

A more recent attempt to update the exploration curriculum has involved an interdisciplinary approach. This approach has become known as the Applied Curriculum in Technology (ACT) curriculum. The ACT curriculum uses "living and working in a technological community" as a central theme for helping students apply academic skills and concepts, explore potential career opportunities, and develop technological literacy. From this central theme, thematic learning modules allow students to explore prominent public and private enterprises in their community (e.g., construction company, fast food restaurant, farm, hospital, newspaper publisher, radio station).* The ACT curriculum was designed to be integrated into junior high/middle school academic and/or industrial programs, offering an opportunity to impact a much larger student base.

Curriculum Development:

Curriculum efforts at the exploration level should focus on achieving the following objectives:

1. Introduce students to a variety of career paths and the technologies associated with them.

2. Help students become technologically literate.

3. Help students achieve the Suggested Learning Outcomes that are necessary for their continued educational development.

* Information extracted from the 1989 Symposium XI article entitled ACT: An Interdisciplinary Curriculum for Applied Academics, Career Exploration and Technological Literacy, written by Kenneth D. Welty.

With such a limited number of schools offering industrial technology programs at the exploration level, future curriculum efforts must be flexible enough to be used in traditional programs as a stand-alone course or integrated in to existing academic courses (e.g., Mathematics, English, Science, Social Studies). Using Suggested Learner Outcomes, existing curriculum materials, and appropriate technological concepts as a guide, a series of Technology-based Learning modules (TLM) should be developed for grades six through eight. Each TLM should:

1. allow students to explore career opportunities and the technologies associated with them.
2. enhance a student's technological literacy.
3. be supported by well defined objectives which are directly linked to learner outcomes and/or clearly stated concepts.
4. be articulated so that each grade, sixth through eighth, will build on the knowledge and experience gained at earlier grades.
5. be interdisciplinary in nature.
6. provide students with experiential, hands-on learning experiences.
7. be designed to be easily integrated into either industrial technology or academic programs.
8. be "user friendly," meaning all materials should be packaged into an easy to use and easy to understand format.

Professional Development:

Since earlier initiatives primarily targeted only industrial technology programs, once the TLMs are developed, a tremendous need for inservice and staff development will exist. Professional development efforts should focus on the following:

1. introducing teachers (both industrial technology and academic), counselors, and administrators to the TLMs and activities.
2. providing teachers (both industrial technology and academic), counselors, and administrators the philosophy, concepts, and content supporting the TLMs.
3. giving teachers (both industrial technology and academic), counselors, and administrators hands-on experiences in using the TLMs.

Professional development activities should be planned around local, regional, and state conferences involving junior high/middle school industrial technology teachers, academic teachers, counselors, and administrators. In addition, extensive inservice should be planned and delivered through contractual agreements. As part of the extensive inservice, teachers should explore the philosophy behind the activities, learn innovative instructional techniques (simulations, problem solving, modeling, cooperative learning, tabletop equipment) and investigate TLM implementation strategies. Since it is important for each inservice to be consistent, a committee representing DAVTE representatives, technology teacher educators from each State University (e.g., Industrial Joint Staff), and industrial advisors should collaborate to design the inservice. Once designed, each University should be available to deliver inservice for their geographical region. Periodically, the inservice should be reviewed and revised to meet changing inservice needs. Exploration professional development activities should be coordinated through organizations such as DAVTE, Regional Systems Directors, and State Universities.

Public Relations and Marketing Strategies:

Like the Awareness level curriculum, new IPITE initiatives at the Exploration level will be considered a new concept for most teachers and administrators. Therefore, the development of effective marketing strategies will be critical to the acceptance and successful implementation of the curriculum. Strategies for marketing the series of Technology-based Learning Modules should include:

1. Pamphlets outlining the Exploration level mission, objectives, and goals. Two types of pamphlets should be created; one directed toward the teachers and one directed toward the administrators.

2. Presentations at local, regional, and State conferences for junior high/middle school industrial technology teachers, academic teachers, counselors, and administrators.

3. Establishing model program sites. The sites should be used to provide inservice and staff development, as well as a place to highlight the new curriculum to regional teachers, administrators, counselors, parents, and news media.

4. Creating a statewide newsletter for Exploration level technology teachers (both traditional and academic). The newsletter should be available to all sixth through eighth grade teachers in the state. The newsletter should highlight model programs, feature outstanding technology teachers, provide staff development and inservice information, introduce new learning activities, and review new products, software, and teaching materials related to the Exploration level curriculum. Funding for the

newsletter should be secured through one or more of the following: DAVTE, professional organizations, teacher subscriptions, and/or private sponsors.

5. A video tape or series of video tapes directed toward target audiences such as colleagues, counselors, administrators, parents, students, etc., highlighting technology education in Illinois. The video(s) should discuss the philosophy behind technology education and explain the curriculum. Further, the video(s) should show quality teachers, programs, and activities in action. Copies of the video(s) should be made available on a cost-recovery basis.

6. Increase opportunity for students to participate in local and statewide competitive events (e.g., Invent America, student organizations, technology fairs).

Exploration marketing activities should be coordinated through organizations such as DAVTE, Regional Systems Directors and State Universities.

ORIENTATION

Introduction:

To date the Orientation level of IPITE (grades nine and ten) has received extensive curriculum development. Over the past decade, orientation initiatives have included: 1) the development and implementation of two curriculum guides; 2) several sets of curriculum materials (e.g., communication, energy utilization, production, transportation activity packets); 3) a number of dissemination and hands-on workshops; and 4) publication of a newsletter which was sent to over three thousand teachers/administrators four times a year. Despite this effort, a recent external evaluation indicates many industrial/technology teachers are still reluctant to change. For this initiative to expand, further development and inservice is needed.

Curriculum Development:

Curriculum efforts at the orientation level should focus on achieving the following objectives:

1. orient students to a wide range (e.g., communication, energy utilization, production, transportation) of capital, human, and financial resources that support technology; to provide foundational skills and processes in industrial technology; and to the application and impact of technology on the environment and society.

2. introduce students to the career opportunities and technologies associated with the broad content areas of communication, energy utilization, production, and transportation.

3. help students become technologically literate.

4. help students achieve the State Goals for Learning that are necessary for their continued educational development.

5. help students achieve the State Goals for Vocational/Technical Education.

6. introduce the students to the basic employability skills needed to enhance future employment opportunities.

Over the past four years, the Orientation curriculum materials have been revised and updated. During this time, a new curriculum guide was developed and four activity packets were updated. Therefore, in the short term (two to three years) curriculum efforts should focus on clarifying and refining existing materials. Short term efforts should include:

1. developing new innovative learning activities which will enhance or reinforce current curriculum content, topics, and concepts.

2. an effort to clearly define the role of Orientation materials (e.g., content, concepts, topics, objectives, breadth and depth), thus, making the curriculum offered at the Orientation level an extension of exploration materials and a prelude to preparation courses.

3. the integration of academic concepts where appropriate.

Over the long term, efforts should be directed toward expanding the Introduction to Technology course. This course should encompass the key concepts of the existing four content areas of communication, energy utilization, production, and transportation, as well as embrace emerging technologies, such a bio-related. The course should be structured around a series of Technology-based Learning Cells (TLC). Each TLC should provide students with a hands-on experience with a variety of real world technology-based applications. Each TLC should be designed around a problem based scenario (e.g., design an automated workcell; develop, film, and edit a school news broadcast; determine the effects diet and exercise have on physical fitness; design, build, and test a vehicle capable of running using only solar energy). The TLCs could be supported with a set of self-contained Learning Stations (LS). The LS will provide students with the basic processes, skills, and technical knowledge to solve the given TLC scenario. For example, if the TLC involved students designing an automated workcell capable of accomplishing a given task, students may need to know (depending on the breadth and depth of the actual scenario) something about computer-aided drafting, computer numeric control, computer integrated manufacturing, quality control, automated systems, input/output controls, robotics, and/or materials-handling systems. Therefore, students will rotate through the stations necessary to

complete the problem outlined in the TLC scenario. In so doing, students will be exposed to a variety of technologies linked by a real world application, thus giving students insight into how technology impacts their life. In addition, the TLCs and LSs should:

1. be flexible enough to be integrated into existing facilities.
2. be easily revised to reflect new trends in technology education.
3. allow for interdisciplinary relationships and integration with the academics.
4. continue to address the orientation objectives discussed above.
5. allow students to focus their studies toward personal and career interest.

Professional Development:

As more orientation teachers revise their programs to reflect technology, the need for staff development continues to increase. The professional development needs of orientation teachers should be provided and supported through the following institutions and organizations:

a. **DAVTE Consultants** - role should be to continue as a leader in all professional development activities. The consultants should be used as a central data base for identifying outstanding teachers and programs. This database should be used to direct local, regional and state professional development organizers in identifying human resources, as well as provide assistance to teachers, counselors and administrators interested in visiting exemplary IPITE programs and teachers. In addition, they should be the center for all current and future curriculum development activities and initiatives.

b. **Regional Systems Directors** - role should be to assess the needs of local teachers, identify and organize university staff, govern ment agencies, and other institutions to provide the services required to fill the local needs.

c. **State Universities** - role should be to provide joint inservice in the areas of technical skills updating and curriculum development. In other words, update teachers in their knowledge of new technologies (e.g., robotics, fiber optics, automated systems, etc.) and then teach them how to take the skills learned and make them generalizable to students. Additionally, such inservice should provide a philosophical understanding of technology-based activities, teach innovative instructional techniques (simulation, problem solving, creative thinking, modeling, etc.), introduce employability skills, discuss student organizations and investigate implementation strategies.

The inservice should be delivered through regional university courses or by establishing technology-based weekends or summer retreats. Several State Universities should design a series of technology-based courses. Then throughout the year, each different course should be rotated to other universities throughout the state, thus, allowing teachers all over the state to receive ongoing regional inservice.

In addition, preservice programs at teacher education institutions should be reviewed and revised to 1) reflect the new technology-based philosophy and content, 2) related technical and academic skills, 3) student organization content, and 4) new innovative instructional strategies.

Further, State Universities could sponsor a new teacher summer retreat. This retreat could help new teachers feel welcome into the profession. Additionally, the retreat could help universities identify program strengths and weaknesses, allow teachers to share ideas, provide new initiative inservice, and discuss relevant topics which impact Industrial Technology Education.

d. **Professional Organizations** - role should be to assess the needs of Industrial Technology educators statewide and provide support through conference sessions, journal articles, and regional inservice.

e. **Business and Industry** - role should be to provide on-site experience for teachers (e.g., internship, VIPs), and technical support and expertise for TLC and LS development.

f. **Statewide Newsletter** (e.g., TNT) - role should be used to keep all industrial educators informed and up-to-date of inservice activities, creative new orientation level learning activity ideas, highlight progressive teachers, and school programs, and provide pertinent information on software and equipment related to teaching technology education. Funding for the newsletter should be secured through one or more of the following: DAVTE, professional organizations, teacher subscriptions, and/or private sponsors.

Public Relations and Marketing Strategies:

Technology courses at the orientation level are typically elective classes. During the '70s and early '80s, enrollments in such elective courses were high and program marketing was not needed. More recently, with the increase in college entrance requirements and dwindling opportunities for students to enroll in elective courses, effective marketing becomes essential to the survival of many programs. No longer can the profession expect to survive by taking a wait-and-see attitude. Efforts to promote technology education must be a high priority in the 1990s.

If marketing and strong public relations are to be effective, they should: 1) be based on good programs, 2) be continuous and on-going (beyond student registration), 3) look professional, and 4) be developed for a variety of audiences (e.g., colleagues, administrators, parents, students, business and industry, board members, politicians, etc.). Orientation marketing efforts should be coordinated through DAVTE and Regional Systems and should include the following:

1. Establishing model program sites. The sites should be used to provide inservice and staff development, as well as a place to highlight the curriculum to regional teachers, administrators, parents, board members, area politicians, and news media.

2. A series of promotional pamphlets outlining the orientation level mission, objectives, goals, and curriculum. Pamphlets should be produced and directed toward colleagues, counselors, administrators, parents, students, etc.

3. A video tape or series of video tapes directed toward target audiences such as colleagues, counselors, administrators, parents, students, etc., highlighting technology education in Illinois. The video(s) should discuss the philosophy behind technology education and explain the curriculum. Further, the video(s) should show quality teachers, programs, and activities in action. Copies of the video(s) should be made available on a cost-recovery basis.

4. Increase efforts to establish more local student organizations (e.g., TSA, VICA) throughout the state.

5. Increase efforts to display (e.g., career days, school board meetings, school display cases, parent conferences, local businesses and malls, etc.) technology-based exhibits and/or establish local technology fairs.

6. Increase efforts to promote Industrial Technology through local and area media (e.g, newspaper, radio stations, cable, and public television).

PREPARATION

Introduction:

The Preparation level of IPITE includes grades eleven through adult. During the last decade, grades eleven and twelve have been the focus of many reform initiatives. Education for Employment (EFE) established a set of occupational task lists. The task lists were used to develop courses within sixty-one local geographical regions. In addition to EFE, Illinois became part of a national curriculum project directed by the Center for Research and Development and the Agency for Instructional Technology (CORD/AIT). Over the years, CORD and AIT have developed a series of

Applied Academic courses (e.g., principles of technology, mathematics, communication, biology, chemistry). Schools throughout the state have pilot tested and implemented several applied courses. In addition, Education for Technology Employment (ETE) developed courses in CAD, CAM, and electronics. More recently, a manufacturing curriculum has been developed for the Preparation level, and is designed to provide students with the technical and employability skills needed for entry-level employment in a variety of manufacturing related positions. A further initiative is called Tech Prep. Tech Prep is an articulated secondary and post-secondary program designed to give students both academic and technical skills. Tech Prep programs offer a great opportunity to unite current preparation level initiatives and expand future initiatives to meet the needs of students beyond high school.

Curriculum Development:

Curriculum development efforts at the Preparation level should focus on achieving the following objectives:

1. to introduce students to the basic academic, technical, and employability skills necessary to be engaged in advanced technical study or employed in a variety of industrial technology occupations.

2. to become technologically literate.

3. to help students achieve the State Goals for Learning that are necessary for their continued educational development.

4. to help students achieve the State Goals for Vocational/Technical Education.

5. continually assess employment trends and develop curriculum that will prepare a person to obtain, change, and/or advance in a career.

Initiatives of the Preparation level should involve developing Tech Prep programs. The Tech Prep programs should include further development of the occupational clusters (e.g., manufacturing, communication, construction, transportation) and the applied academics into a series of coherent, articulated courses of study. Tech Prep programs should:

1. clearly define the roles of Preparation materials (e.g., content, concept, topics, objectives, breadth and depth), thus making the curriculum offered at the secondary Preparation level an extension of Orientation materials and a prelude to post-secondary preparation courses.

2. be easily revised to reflect new trends in industrial technology education.

3. be dependent upon interdisciplinary relationships and integration opportunities with the academics.

4. allow students to focus their studies toward personal and career interests.

5. be consistent with the Preparation level objectives stated above.

6. promote post secondary (e.g., university, technical schools, apprenticeships, community colleges, etc.) articulation.

7. promote business, industry and education partnerships.

8. enhance opportunities for lifelong learning.

Professional Development:

Like Orientation, Preparation continues to need staff development. The professional development needs of preparation teachers should be provided and supported through the following institutions and organizations:

a. **DAVTE Consultants** - role should be to continue as a leader in all professional development activities. The consultants should be used as a central database for identifying outstanding teachers and programs. This database should be used to direct local, regional and state professional development organizers in identifying human resources, as well as provide assistance to teachers, counselors and administrators interested in visiting exemplary IPITE programs and teachers. In addition, they should be the center for all current and future curriculum development activities and initiatives.

b. **Regional Systems Directors** - role should be to assess the needs of local teachers, identify and organize university staff, government agencies, and other institutions to provide the services required to fill the local needs.

c. **State Universities** - role should be to provide joint inservice in the areas of technical skills updating and curriculum development. In other words, update teachers in their knowledge of new technologies (e.g., robotics, fiber optics, automated systems, etc.) and then teach them how to take the skills learned and make them generalizable to students. Additionally, such inservice should provide a philosophical understanding of technology-based activities, teach innovative instructional techniques (simulation, problem solving, creative thinking, modeling, etc.) introduce employability skills, discuss student organizations and investigate implementation strategies.

The inservice should be delivered through regional university courses or by establishing technology-based weekends or summer retreats. Several State Universities should design a series of technology-based courses. Then throughout the year, each different course should be rotated to other universities throughout the state, thus, allowing teachers all over the state to receive ongoing regional inservice.

In addition, preservice programs at teacher education institutions should be reviewed and revised to 1) reflect the new technology-based philosophy and content, 2) related technical and academic skills, 3) student organization content, and 4) new innovative instructional strategies.

Further, State Universities could sponsor a new teacher summer retreat. This retreat could help new teachers feel welcome into the profession. Additionally, the retreat could help universities identify program strengths and weaknesses, allow teachers to share ideas, provide new initiative inservice, and discuss relevant topics which impact Industrial Technology Education.

d. **Professional Organizations** - role should be to assess the needs of Industrial Technology educators statewide and provide support through conference sessions, journal articles, and regional inservice.

e. **Business and Industry** - role should be to provide on-site experiences (e.g., internships, VIPs).

f. **Statewide Newsletter** (e.g., TNT) - the newsletter should be used to keep all industrial educators informed and up-to-date of inservice activities, creative new preparation level learning activity ideas, highlight progressive teachers, and school programs, and provide pertinent information on software and equipment related to teaching technology education. Funding for the newsletter should be secured through one or more of the following: DAVTE, professional organizations, teacher subscriptions, and/or private sponsors.

Public Relations and Marketing Strategies:

Most Preparation courses like those offered at the Orientation level are elective classes and have experienced declining enrollment throughout the 1980s. Therefore, efforts to promote preparation level courses must take a high priority in the 1990s.

If marketing and strong public relations are to be effective, they should: 1) be based on good programs, 2) be continuous and on-going (beyond student registration) 3) look professional, and 4) be developed for a variety of audiences (e.g., colleagues, adminis-

trators, parents, students, business and industry, board members, politicians, etc.). Future marketing efforts should include the following:

1. Establish model program sites. The sites should be used to provide inservice and staff development, as well as a place to highlight the curriculum to regional teachers, administrators, parents, board members, area politicians, and news media.

2. A series of promotional pamphlets outlining the preparation level mission, objectives, goals, and curriculum. Pamphlets should be produced and directed toward colleagues, counselors, administrators, parents, students, etc.

3. A video tape or series of video tapes directed toward target audiences such as colleagues, counselors, administrators, parents, students, etc., highlighting technology education in Illinois. The video(s) should discuss the philosophy behind technology education and explain the curriculum. Further, the video(s) should show quality teachers, programs, and activities in action. Copies of the video(s) should be made available on a cost-recovery basis.

4. Increase efforts to establish more local student organizations (e.g., TSA, VICA) throughout the state.

5. Increase efforts to display (e.g., career days, school board meetings, school display cases, parent conferences, local businesses, malls and etc.) technology based exhibits and/or establish local technology fairs.

6. Increase efforts to promote Industrial Technology Education through local and area media (e.g., newspapers, radio stations, public and cable television).

IMPLEMENTATION PLAN

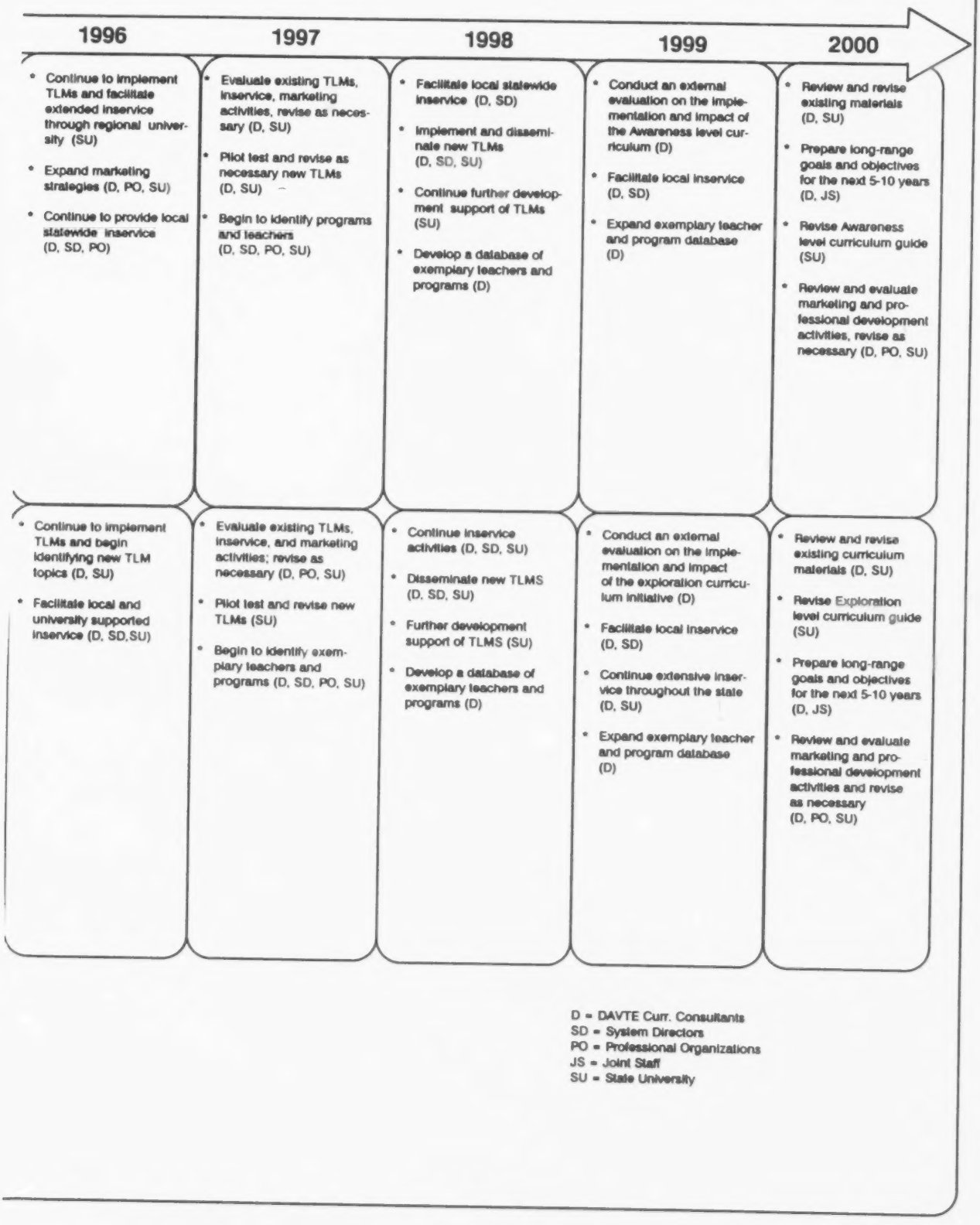
In the pages that follow, the Futuring Committee report outlines strategies for implementing the IPITE, K through adult, curriculum through the year 2000. Key organizations and institutions have been identified to help during the implementation process. These groups include DAVTE, regional system directors, state professional organizations (e.g., IVA/IITEA), Joint Staff, and State Universities.

INITIATIVE EVALUATION

If the goals and objectives outlined in this report are to be realized, ongoing evaluation is essential. Therefore, with leadership provided by DAVTE Industrial Consultants, the Futuring Committee should continue to meet on an annual basis (possibly in conjunction with the IVA/IITEA state conference) to discuss, evaluate, and revise the IPITE K through adult implementation plan. Additionally by 1999, DAVTE should initiate an external evaluation of the entire IPITE K through adult curriculum initiatives. The results of this external evaluation should be used as a basis for establishing future goals and objectives beyond the year 2000.

IPITE IMPLEMENTATION PLAN

		1992	1993	1994	1995
AWARENESS	K ↓ 5	• Establishing institutions and funding sources for developing awareness level curriculum. (D, JS) • Review local, state, and national curriculum initiatives. (D, SU) • Review state suggested learning outcomes. (D, SU) • Based on the review, establish specific articulated goals and objectives for each grade, K-5. (D, SU)	• Based on the findings of the review of literature, develop a series of TLMs for each grade, K-5. (SU) Curriculum characteristics: - support suggested learning outcomes - foster an awareness of technology and its impact on society and the environment - articulated for each grade, K-5 - provide hands-on learning experiences - utilize low-cost, low-tech easy-to-obtain materials - easily integrated into existing program - be interdisciplinary in nature • Based on findings and curriculum characteristics: - develop an awareness level curriculum guide (SU)	• Test TLMs with students (SU) • Modify and revise, retest as necessary (SU) • Prepare final draft of materials (SU) • Develop statewide implementation, marketing, and professional development strategies (D, PO, JS, SU)	• Implement marketing strategies (D, PO, SU) • Implement and disseminate TLMs statewide (D, PO, SU) • Develop local and university-supported extensive inservice (D, JS, SD, PO, SU)
EXPLORATION	6 ↓ 8	• Identify institutions and funding sources for expanding and developing exploration level materials (D, JS) • Review existing state, develop materials (e.g., ACT exploration series) (D, SU) • Review national curriculum initiatives (D, SU) • Review state suggested learning outcomes (D, SU) • Based on the review, establish specific articulated goals and objectives for each grade, 6 through 8 (D, JS, SU)	• Based on a review of literature, develop a series of TLMs for each grade, 6 through 8 (SU) Curriculum characteristics: - supports suggested learning outcomes - introduce students to a variety of technologies and related careers - enhance a student's technological literacy - be articulated - provides hands-on learning experience - easily integrated into existing traditional and academic programs - be interdisciplinary in nature • Based on findings and curriculum characteristics: - develop an exploration level curriculum guide (SU)	• Test the TLMs with students (SU) • Modify and revise as necessary (SU) • Compare final draft of materials (SU) • Develop statewide implementation marketing and professional development activities (D, PO, JS, SU)	• Implement marketing plan (D, SD, PO, SU) • Disseminate and implement TLMs (D, SD, SU) • Develop local and university suported inservice programs (D, JS, SU)


1996
1997
1998
1999
2000
• Continue to implement TLMs and facilitate extended inservice through regional university (SU)
• Expand marketing strategies (D, PO, SU)
• Continue to provide local statewide inservice (D, SD, PO)
• Evaluate existing TLMs, inservice, marketing activities, revise as necessary (D, SU)
• Pilot test and revise as necessary new TLMs (D, SU)
• Begin to identify programs and teachers (D, SD, PO, SU)
• Facilitate local statewide inservice (D, SD)
• Implement and disseminate new TLMs (D, SD, SU)
• Continue further development support of TLMs (SU)
• Develop a database of exemplary teachers and programs (D)
• Conduct an external evaluation on the implementation and impact of the Awareness level curriculum (D)
• Facilitate local inservice (D, SD)
• Expand exemplary teacher and program database (D)
• Review and revise existing materials (D, SU)
• Prepare long-range goals and objectives for the next 5-10 years (D, JS)
• Revise Awareness level curriculum guide (SU)
• Review and evaluate marketing and professional development activities, revise as necessary (D, PO, SU)
• Continue to implement TLMs and begin identifying new TLM topics (D, SU)
• Facilitate local and university supported inservice (D, SD,SU)
• Evaluate existing TLMs, inservice, and marketing activities; revise as necessary (D, PO, SU)
• Pilot test and revise new TLMs (SU)
• Begin to identify exemplary teachers and programs (D, SD, PO, SU)
• Continue inservice activities (D, SD, SU)
• Disseminate new TLMS (D, SD, SU)
• Further development support of TLMS (SU)
• Develop a database of exemplary teachers and programs (D)
• Conduct an external evaluation on the implementation and impact of the exploration curriculum initiative (D)
• Facilitate local inservice (D, SD)
• Continue extensive inservice throughout the state (D, SU)
• Expand exemplary teacher and program database (D)
• Review and revise existing curriculum materials (D, SU)
• Revise Exploration level curriculum guide (SU)
• Prepare long-range goals and objectives for the next 5-10 years (D, JS)
• Review and evaluate marketing and professional development activities and revise as necessary (D, PO, SU)
D = DAVTE Curr. Consultants
SD = System Directors
PO = Professional Organizations
JS = Joint Staff
SU = State University

IPITE IMPLEMENTATION PLAN

		1992	1993	1994	1995
ORIENTATION	9 ↓ 10	• Develop an extended inservice program (D,JS, SU) • Organize and deliver localized inservice through the regional systems (D, SD, SU) • Establish a directory of exemplary teachers and programs (D, SD, JS, SU)	• Facilitate localized inservice (D, SD, SU) • Prepare orientation marketing materials (e.g., pamphlets, video tapes) (D, PO, JS) • Develop support activities and materials which integrate academic concepts where appropriate and support State Goals for Learning (D, SU)	• Disseminate marketing products (D, SD, PO, SU) • Organize a committee to revise the Orientation Curriculum Guide and activities (D, JS, SU) • Facilitate local and extensive inservice (D, SD, PO, SU) • Revise exemplary teacher program directory (D, SD, PO, SU)	• Continue to facilitate inservice (D, SD, PO, SU) • Disseminate revised Orientation Curriculum Guide (D, SU) • Develop a series of TLCs (SU) • Curriculum characteristics: - Introduce students to various careers & their technologies - Support State Goals for Learning - Include technical areas: Construction Communication Energy Utilization Production Transportation Bio-related - Be articulated - Allow for interdisciplinary relationships and integration with academics
PREPARATION	11 ↓ ADULT	• Develop a local extended inservice for Tech Prep (D, SD, JS, SU) • Expand efforts to establish Tech Prep courses (D, SD, SU) Curriculum characteristics: - Support State Goals for Learning - Support State Goals for Technical Education - Enhance technological literacy - Provide academic, technical, and employability skills - Provide further education and career opportunities - Integrate academics - Interdisciplinary in nature - Promote business, industry, and education partnerships - Enhance opportunities for life-long learning - Be articulated (9-adult)	• Facilitate localized inservice (D, SD) • Expand efforts to develop Tech Prep programs (D, SD,SU) • Prepare Preparation marketing materials (pamphlets, video tapes, etc.) (D, PO, SU) • Establish directory of exemplary teachers and programs (D, PO, SD, SU) • Evaluate state university teacher education programs and revise as necessary (JS, SU) • Provide extended inservice for Tech Prep (JS, SU)	• Facilitate localized inservice (D, SD, SU) • Provide extended inservice (JS, SU) • Disseminate marketing materials (D, SD, PO, SU) • Expand Tech Prep programs, program initiatives (D, SD, SU) • Develop a Preparation Curriculum Guide (SU)	• Facilitate localized inservice (D, SD, SU) • Continue to provide extended inservice (JS, SU) • Disseminate marketing materials (D, SD, PO, SU) • Evaluate initial Tech Prep programs and revise as necessary (D, JS, SU) • Revise teacher/program directory (D, SD, PO, SU)

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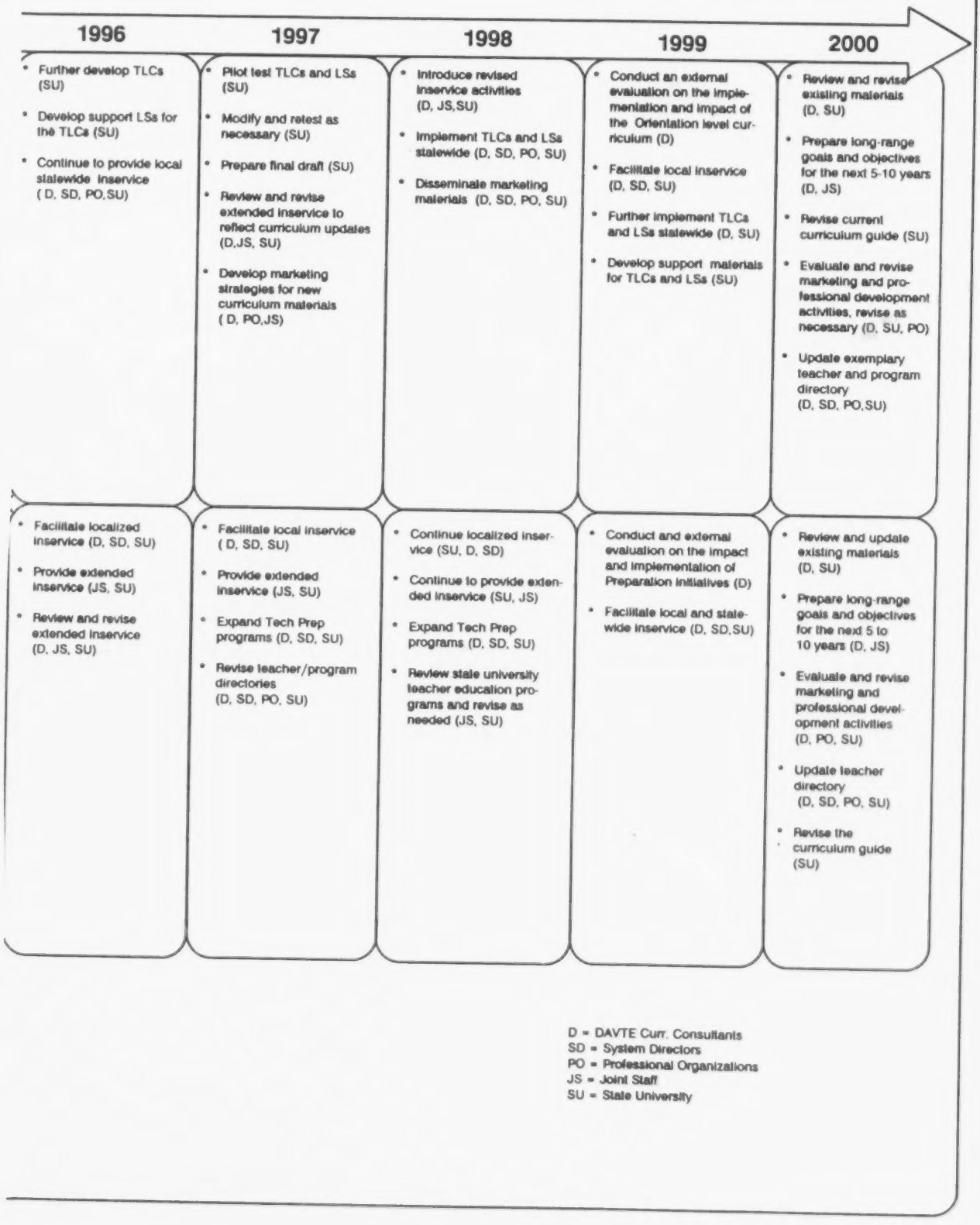
1996
1997
1998
1999
2000
• Further develop TLCs (SU)
• Develop support LSs for the TLCs (SU)
• Continue to provide local statewide inservice (D, SD, PO,SU)
• Pilot test TLCs and LSs (SU)
• Modify and retest as necessary (SU)
• Prepare final draft (SU)
• Review and revise extended inservice to reflect curriculum updates (D,JS, SU)
• Develop marketing strategies for new curriculum materials (D, PO,JS)
• Introduce revised inservice activities (D, JS,SU)
• Implement TLCs and LSs statewide (D, SD, PO, SU)
• Disseminate marketing materials (D, SD, PO, SU)
• Conduct an external evaluation on the implementation and impact of the Orientation level curriculum (D)
• Facilitate local inservice (D, SD, SU)
• Further implement TLCs and LSs statewide (D, SU)
• Develop support materials for TLCs and LSs (SU)
• Review and revise existing materials (D, SU)
• Prepare long-range goals and objectives for the next 5-10 years (D, JS)
• Revise current curriculum guide (SU)
• Evaluate and revise marketing and professional development activities, revise as necessary (D, SU, PO)
• Update exemplary teacher and program directory (D, SD, PO,SU)
• Facilitate localized inservice (D, SD, SU)
• Provide extended inservice (JS, SU)
• Review and revise extended inservice (D, JS, SU)
• Facilitate local inservice (D, SD, SU)
• Provide extended inservice (JS, SU)
• Expand Tech Prep programs (D, SD, SU)
• Revise teacher/program directories (D, SD, PO, SU)
• Continue localized inservice (SU, D, SD)
• Continue to provide extended inservice (SU, JS)
• Expand Tech Prep programs (D, SD, SU)
• Review state university teacher education programs and revise as needed (JS, SU)
• Conduct and external evaluation on the impact and implementation of Preparation initiatives (D)
• Facilitate local and statewide inservice (D, SD,SU)
• Review and update existing materials (D, SU)
• Prepare long-range goals and objectives for the next 5 to 10 years (D, JS)
• Evaluate and revise marketing and professional development activities (D, PO, SU)
• Update teacher directory (D, SD, PO, SU)
• Revise the curriculum guide (SU)

D = DAVTE Curr. Consultants
SD = System Directors
PO = Professional Organizations
JS = Joint Staff
SU = State University

Illinois
State Board of
Education
100 North First Street
Springfield, Illinois 62777

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Illinois State Board of Education

Robert Leininger
State Superintendent of Education

Franzie Loepp, *Director*
Illinois Plan for Industrial
Technology Education

An Equal Opportunity/Affirmative Action
Employer

Printed by the Authority of the State of Illinois
6/91

APPENDIX D

Technology News Today

Illinois
Industrial Education
Newsletter

Volume 6
Number 1
September, 1990

TECHNOLOGY TODAY NEWS

Preparing Students for Manufacturing Careers in the Year 2000 and Beyond

Just-in-time, statistical process control, high involvement management, work cells, vision measurement, robotics, computer integrated manufacturing. These concepts, and many others, are common in today's manufacturing industries. The nature of manufacturing jobs is changing. Students wishing to enter manufacturing careers must possess more mathematics, science and communication skills than ever before. They must also have a broad base of technical skills. How well is your program preparing the type of students that modern manufacturing industries need?

In an attempt to help preparation level (11th and 12th grade) teachers improve their manufacturing technology programs, the Illinois State Board of Education and Northern Illinois University have combined forces to develop a Manufacturing Technology curriculum. A manufacturing technical committee made up of eleven managers from manufacturing firms across Illinois met to provide project staff with input to help structure the new curriculum initiative. These manufacturing representatives stressed competencies such as problem solving, communication, team work, quality control and safety. They also placed substantial emphasis on an ability to transfer complex mathematics and science competencies to a variety of workplace situations. Technical skills were also important though they need to be more broad in scope to compensate for changes in how manufacturing jobs are performed.

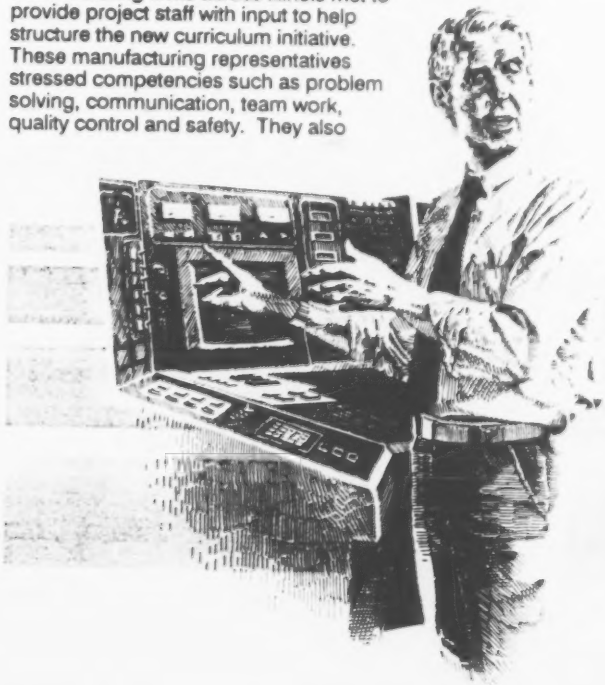
Using input from this technical committee, four innovative classroom teachers developed a curriculum designed to be laboratory-based and address the competencies stressed by the technical committee. This curriculum guide then was field-tested with students in seven different high schools. The results of the field tests were incorporated into the final curriculum guide which will be disseminated beginning in November.

In keeping with the changes in technology, the Manufacturing Technology Curriculum will be disseminated in conjunction with a satellite broadcast teleconference scheduled on November 6th and 7th, 1990. The broadcast will be received at various sights around Illinois and interested teachers can attend a broadcast, hear from teachers involved in the field test, and receive a copy of the curriculum. Announcements of the broadcasts will be mailed to all secondary teachers currently teaching in manufacturing, combined metal trades and cabinet making programs. Education for Employment (EFE) system directors will also receive announcements. Be sure to watch for information regarding a broadcast site close to you.

If you are unable to attend a broadcast, you may get a copy of the curriculum beginning in December from your EFE system director. Each system director will be provided with the curriculum stored on diskette. You can print out any or all of the curriculum you wish. The curriculum will also be available on a cost recovery basis through the :

Curriculum Publications
Clearinghouse
Western Illinois University
Horrabin Hall 48
Macomb, Illinois 61455
(800) 322-3905

This is an opportunity for you to get up-to-date information which can be used to improve your manufacturing program. Be sure to watch for more information on the teleconference and get your copy of the curriculum in November.



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Lights, Cameras, Action: Video Contest

All over the state of Illinois, teachers are shooting students. Yes, you read it right. Teachers are shooting students testing solar collectors, students flying lighter-than-air balloons, and students engaged in line production activities. This type of behavior is not only being encouraged, it is being rewarded. It has been observed by project staff, DAVTE consultants, and others, that industrial/technology teachers throughout the state have made great video tapes highlighting their programs.

Up to now, few have benefited from these instructors' creativity. Well, that is about to change. It is time to come out of the closet and share your work. The Illinois Plan for Industrial Technology Education project is sponsoring a video tape contest. The purpose of the contest is to collect a variety of video tapes from schools and instructors throughout the state, depicting technology-based programs in Illinois. It is hoped that the tapes can be combined and edited to make a single videotape showcasing industrial/technology education at work in Illinois. But, this ambitious task can not take place without your help and support.

Contest Rules:

The rules for submitting an entry are as follows:

1. All entries must be made using a 3/4" VHS format.
2. Each entry should be fifteen minutes or less in length.
3. Video content must be related to areas of communication, energy utilization, production or transportation technology.
4. All footage should be process oriented and include students engaged in technology-based activities.
5. All tapes will become the property of DAVTE.
6. All entries must be submitted and received by January 15, 1991. Participants are encouraged to submit more than one entry. Each entry submitted should meet the criteria stated above.

Awards:

A panel consisting of project staff and DAVTE industrial consultants, will review each entry and select the top three. Awards for the top three entries include:

- $200 for first place
- $150 for second place
- $100 for third place.

Entry Information:

All entries should be mailed to Dennis Gallo, 210 Turner Hall, Illinois State University, Normal, IL 61761. For more information contact Dennis at (309)438-2610.

Do not miss this opportunity to show others the impact industrial/technology programs have made in Illinois.

Looking Toward the Future

The scene was a coffee shop at a state convention and the time was February, 1978. Several industrial arts teachers and teacher educators were discussing the convention agenda and someone questioned, "Ten years from now, will we still be organizing the convention around the topics of woodworking, drafting, metalworking, automotive, electronics, and energy/power?" The response was, "It's been that way for many years, it will probably never change." But then someone quarried, "When's the last time we had a state curriculum guide?" A mature colleague remembered. "It was back in 1963 – more than 20 years ago!"

From that moment on, curriculum has been changing in Illinois. For the past decade, the Illinois State Board of Education, Department of Adult, Vocational and Technical Education has funded a comprehensive study and revamping of industrial education. Throughout the 1980's, technology-based curriculum materials were developed, pilot tested, and implemented. Over one-hundred dissemination and implementation workshops were conducted. A statewide newsletter, Technology News Today, was established and sent to over three thousand teachers and administrators four times a year. In addition, the past decade has brought educators other curriculum movements like Principles of Technology and Applied Mathematics.

Subsequently, many middle school, orientation, and vocational teachers have updated their traditional industrial education courses and moved toward a technology-based curriculum. Despite the efforts of the 80's many questions remain and new ones arise. What impact will the new Carl Perkins legislation have on industrial education in Illinois? Where are the new industrial technology educators going to come from? How can we utilize and expand the curriculum movements of the 80's into one articulated comprehensive K-adult program? What skills will students in the 90's need to survive in the world of work in and beyond the year 2000? What resources are available to see that teachers and students are equipped to meet the challenges of the future?

As we begin the 1990's, it's time to evaluate the past and plan for the future. Therefore, a task force, representing all levels of education, is being established to meet and address this challenge. The purpose of the task force is to develop a comprehensive plan for industrial education for grades kindergarten through adult. Task force members will address such concerns as curriculum and professional development, evaluation, integration, public relations, and resources.

Position Change

Dr. Louis Butler of Eastern Illinois University recently received his doctorate from SIU-C and has been named acting Associate Dean of the School of Technology at Eastern Illinois University.

Ken Welty has accepted a position as Lecturer at the University of Illinois. He will continue to give leadership to the ACT curriculum project, a middle school project stressing applied academics, career exploration, and technological literacy.

Dr. Franzie Loepp, a faculty member at Illinois State University for 20 years, is now the Chairperson of the Industrial Technology Department at Illinois State University.

Action/Reaction Propulsion System

Introduction:

The Action/Reaction propulsion system is based on a learning activity submitted to the Illinois Plan for Industrial Technology Education by Ron Weseloh of Red Bud High School in Red Bud, Illinois. Ron's activity gained acclaim during last year's Transportation Technology workshop. Based on the experience, many teachers throughout the state have utilized this activity to enhance their transportation course. Using this highly motivational activity and a few low cost materials, students can experience first-hand Isaac Newton's third law of motion which states, "To every action there is an equal and opposite reaction." This technology-based activity will show students how the action/reaction principle applies to propulsion systems on jet aircraft and rockets.

Materials and Equipment:

A. 2 3.50 butt hinges
B. 12 .75 in. #6 wood screws
C. 4 1.50 in. #6 machine screws
D. 4 .75 in. #6 wood screws
E. 1 flat washer
F. 1 band clamp
G. 1 3.00 x 1.50 in. 16 gauge steel plate
H. 1 truck tire
I. 1 #3 chemistry stopper
J. 1 2 liter plastic soda bottle
K. 1 .25 x 10.00 x 12.00 in. piece of plexiglass

Workshops For 1990-91

In 1989-90 regional workshops were held throughout the state in areas of Transportation and Production Technology. To follow-up, orientation workshops for Communication Technology and Energy Utilization Technology will be offered in 1990-91. This fall, seven Communication workshops will be conducted, followed by seven Energy Utilization workshops in the spring. All workshops will include a variety of hands-on activities, as well s provide teachers the opportunity to learn from teachers in the field.

Workshop Focus:

As in earlier workshops, teachers will rotate through several sessions. The sessions will include ideas and activities to enhance existing programs or provide assistance when starting a new program.

During the Communication Technology workshops, participants will interact with current Communication Technologies such as electronic publishing, CAD, and electronic imaging, as well as receive technical updates and receive new curriculum materials. During other sessions, participants will have the opportunity to learn from teachers in the field.

During the Energy Utilization Technology workshops, participants will interact with current energy topics like passive and active solar energy, geothermal power, hydroelectric power, and recycling. Like the Communication workshops, teachers will receive new curriculum materials.

Registration Information:

Because of the facilities required to conduct the type of inservice described, only fourteen workshops are being planned - seven Communication Technology, and seven Energy Utilization Technology workshops. Also due to the limited number of sites, the enrollment will be restricted to the first 100 people preregistering per workshop. Therefore, all participants must PREREGISTER. Registration will NOT be conducted on the day of the workshop. Please use the preregistration form attached, and check the workshop or workshops you would like to attend. Then, send the form, along with $15.00 (checks payable to Illinois State University) to Dennis Gallo, 210 Turner Hall, Illinois State University, Normal, IL 61761. Since registration will not be accepted after the deadline (see preregistration form below), be sure to register early.

Do not miss this opportunity to update your industrial/technology education curriculum, obtain new materials, and get together with other educators. For more information, contact Dennis Gallo at (309)438-2610.

PRE-REGISTRATION FORM

NAME _____ SCHOOL _____ PHONE (____)_____

STREET ADDRESS _____ CITY _____ STATE_____ ZIP_____

COMMUNICATION TECHNOLOGY

	DATES	TIME	LOCATION
☐	Oct. 2, 1990 Pre-reg. by Sept. 18	9:30 am-3:00pm	Rock Valley College Tech Center, Rockford
☐	Oct. 17 Pre-reg. by Oct. 3	4:30 pm-8:00pm	Dunbar Voc. Center Chicago
☐	Oct. 31 Pre-reg. by Oct. 17	9:30 am-3:00 pm	Forest View Ed Center Arlington Hts.
☐	Nov. 7 Pre-reg. by Oct. 24	9:00 am-3:00 pm	Eisenhower H.S. Blue Island
☐	Nov. 28 Pre-reg. by Nov. 14	12:00 - 4:30 pm	Capital Area Voc. Center, Springfield
☐	Dec. 6 Pre-reg. by Nov. 22	12:00 - 4:30 pm	Galesburg H.S. Galesburg
☐	Dec. 12 Pre-reg. by Nov. 28	9:30 am-3:00 pm	Mt. Vernon H.S. Mt. Vernon

ENERGY UTILIZATION TECHNOLOGY

	DATES	TIME	LOCATION
☐	Feb. 6, 1991 Pre-reg. by Jan 23	9:30 am-3:00 pm	Mt. Vernon H.S. Mt. Vernon
☐	Feb. 21 Pre-reg. by Feb. 7	9:30 am-3:00 pm	Forest View Ed Center Arlington Hts.
☐	Mar 1 Pre-reg. by Feb. 15	8:30 am-1:00 pm	Galesburg High School Galesburg
☐	Mar. 6 Pre-reg. by Feb. 20	12:00-4:30 pm	Springfield Area Voc. Center, Springfield
☐	Mar. 13 Pre-reg. by Feb. 27	9:30 am-3:00 pm	Rock Valley Col Tech Center, Rockford
☐	Apr.11 Pre-reg. by Mar. 28	9:00 am-3:00 pm	H. L. Richards H.S. Oaklawn
☐	April 17 Pre-reg. by Apr. 3	4:30 pm-8:00 pm	Dunbar Voc. Center Chicago

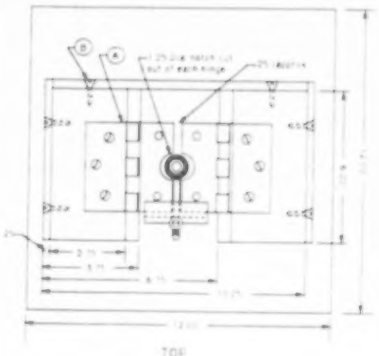
** Please send Pre-registration form and a $15.00 check **payable to Illinois State University** for each workshop you plan to attend to:

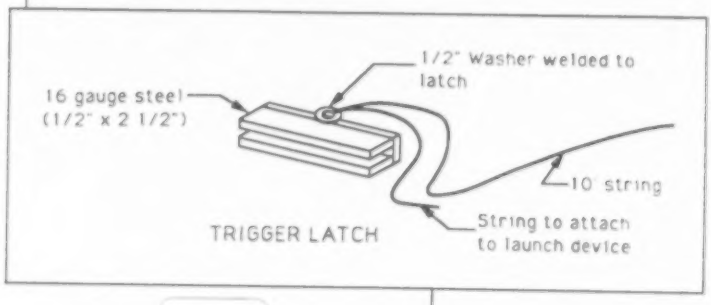
Dennis Gallo, 210 Turner Hall, Illinois State University, Normal,-IL 61761.

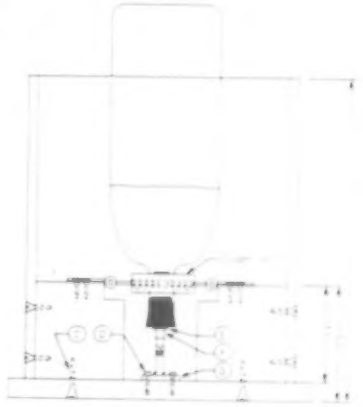
L. 2 .25 x 6.00 x 12.00 in. pieces of plexiglass
M. 1 base .75 x 12.00 x 12.00 in. piece of wood
N. 2 support blocks, 3.50 x 3.50 x 6.00 piece of wood with .75 x .75 in. rabbit cut along one side.
O. 1 tube of plexiglass adhesive
P. 1 air compressor or bicycle pump with pressure gauge
Q. 1 simple altitude tracking device (see illustration)

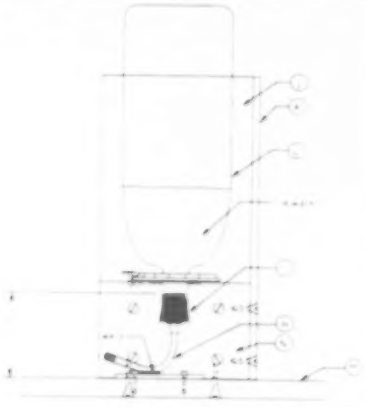
Making a pneumatic launching device:

1. Using the illustrations as a guide, locate and fasten the two support blocks to the wooden base.
2. Using the illustration as a guide, weld a truck tire valve to the steel plate. Once in place, attach the band clamp, washer, and #3 chemistry stopper to the truck tire valve. Then, locate and fasten the steel plate between the two support blocks.
3. Using a cutting torch, carefully cut a 1.25 in. diameter half circle in each of the butt hinges. Once completed, mount the two hinges to the support blocks.



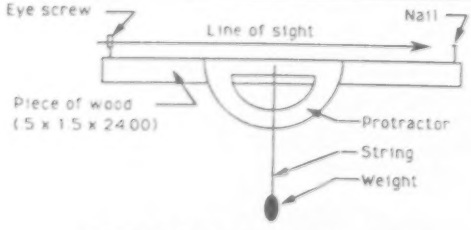






PNEUMATIC PROPULSION SYSTEM

4. Since this activity requires the use of compressed air, a plexiglass frame will be added to insure safety. Using the illustration as a guide, attach plexiglass sheets to three sides of the support blocks. Finish by gluing the corners.
5. Finally, use the illustration as a guide to construct a trigger latch. Make sure the trigger will fit over the two hinges and release freely. Tie two pieces of string to the trigger latch. One should be at least ten feet long and the other one foot long. The short string should be fastened to the launching device. This will prevent the latch from flying back and hitting someone.



SIMPLE ELEVATION TRACKING DEVICE

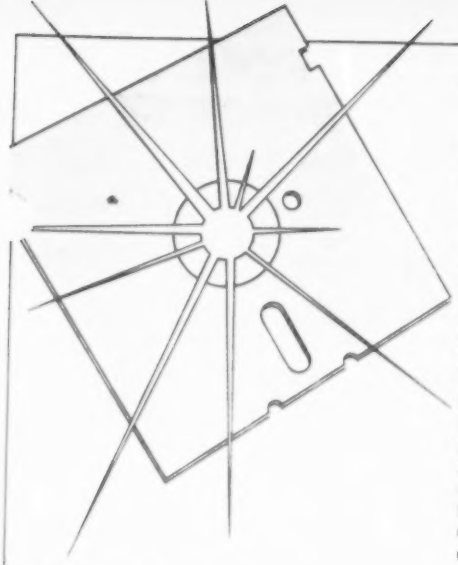
Table of Tangents

Angle	Tan	Angle	Tan	Angle	Tan	Angle	Tan	Angle	Tan
1	02	17	31	33	65	49	1.15	65	2.14
2	03	18	32	34	67	50	1.19	66	2.25
3	05	19	34	35	70	51	1.23	67	2.36
4	07	20	36	36	73	52	1.28	68	2.48
5	09	21	38	37	75	53	1.33	69	2.61
6	11	22	40	38	78	54	1.38	70	2.75
7	12	23	42	39	81	55	1.43	71	2.90
8	14	24	45	40	84	56	1.48	72	3.08
9	16	25	47	41	87	57	1.54	73	3.27
10	18	26	49	42	90	58	1.60	74	3.49
11	19	27	51	43	93	59	1.66	75	3.73
12	21	28	53	44	97	60	1.73	76	4.01
13	23	29	55	45	1.00	61	1.80	77	4.33
14	25	30	58	46	1.04	62	1.88	78	4.70
15	27	31	60	47	1.07	63	1.96	79	5.14
16	29	32	62	48	1.11	64	2.05	80	5.67

Activity Procedure:

1. This activity can be conducted as a demonstration or small group activity. Because of the nature of this activity, it is best to conduct it outside in a large open area.
2. Begin by introducing the students to Newton's third law of motion. Explain when a force is applied to an object, there is also an equal and opposite force acting on the object. Explain further, if the force is in the form of pressure inside an enclosed container, a balloon for example, the force is exerted equally in all directions. As long as the balloon remains closed, the force will remain equal. If the balloon is opened at one end, the air will rush out. The force caused by the air leaving the balloon produces an equal and opposite reaction, thus, causing the balloon to propel forward.
3. Since the activity compares the distance the bottle travels during each flight, take some time to explain how to calculate altitude.

(continued on page 6)



Software Review

SimCity

Imagine for a moment you could be mayor and city planner of a large city like San Francisco or Tokyo. As a mayor and planner, would the city grow and prosper or become an economic waste land? Where would you expand? Would you build a new power plant? Should your city have a mass transit system? Would decisions you make encourage new jobs and improve the quality of life? Well, imagine no more. SimCity is a city planning simulation software package which can allow students the opportunity to manage the growth of an existing city or create a dream city from the ground up. Using SimCity, students will see first-hand how their decisions impact the future of a city.

With SimCity students take charge of city planning through a set of RULES and TOOLS. The RULES are based on city planning and management. They include human factors (e.g., identity of residential space, availability of jobs, quality of life); economic factors (e.g., land values, industrial and commercial space, market places, power plants, tax base); survival factors (e.g., disasters, crime, pollution); and political factors (e.g., political opinion, zoning, and residential and business satisfaction). The TOOLS provide students the ability to plan, lay out, zone, build, bulldoze, rezone, and manage the city. By using various TOOLS, students are able to design residential and work areas, identify road and transit systems, and locate recreational areas. TOOLS can also be used to set zoning boundaries for parks, place railroads, identify fire stations, erect sports stadiums, and locate power plants. Finally, TOOLS can clear a forest for city growth, build a landfill along waterways, and rezone developed areas.

Using the program's various mapping and graphic displays, students can gather up-to-date information on traffic density, population trends, power grid status, pollution, crime, land value, police, fire and transportation department efficiency, and cash flow.

Students can experience SimCity one of two ways. First, they can choose one of eight given scenarios. Each scenario is an existing city which is either the victim of poor planning, or about to become the victim of a natural disaster. This scenario includes cities like San Francisco, California prior to the 1906 earthquake; Hamburg Germany during World War II;Tokyo Japan struggling with giant sea monsters; Detroit, Michigan coping with crime; and Boston, Massachusetts in the year 2010, facing a nuclear meltdown. Secondly, students can design, manage, and maintain the city of their dreams. Using the TOOLS and RULES, students can create either thriving metropolises with lots of people, cars, and tall buildings, or a small rural community with a slower pace of living. In either case, as long as the students can provide a place for people to live, work, shop, and play while controlling traffic, pollution, overcrowding, crime, and taxes, the city will live and grow. If not, people in the city will leave, creating slums and areas of economic decay and unrest.

SimCity is available for both IBM compatibles and MacIntosh computer systems. IBM and IBM compatibles require 512K of memory, one floppy disk drive (5 1/4" or 3 1/2"), graphic card (EGA, VGA, CGA, Tandy, Hercules), and a color or monochrome monitor. Optional hardware requirements include a second drive or hard drive, an Epson or IBM printer, and a mouse or joy stick.

SimCity will work on any Macintosh Plus, SE, II, IIX and IICX, with 512K of memory. A hard drive is highly recommended. The IBM version costs approximately $60. The Macintosh version costs approximately $60 (black and white) and $80 (color). SimCity is also available for Commodore 64/128 computers for about $30 and Amiga computers for about $45.

SimCity is available through Maxis Software, 1042 Country Club Drive, Suite C, Moraga, California 94556. For more information, call (415) 376-6434.

Take 1 Review

Take 1 can turn your Apple computer into a graphics studio capable of producing sophisticated animated movies. Using various menu driven tools, students can draw pictures, color fill objects, edit graphics, and take snapshots. In addition, students can shoot scenes frame-by-frame, splice scenes together, add professional fades, and then play it all back in the form of an animated movie. With Take 1, students will be able to create a professional looking presentation, spice-up video tapes, or make movies. This can be an excellent tool for enhancing a Communication Technology class.

Take 1 consists of actors, snapshots, frames, scenes, and movies. Actors and snapshots are hi-res pictures that can be moved around the screen. Actors or snapshots can then added to frames. In addition to actors and snapshots, a frame can have TEXT, SOUNDS, and PAUSES. A scene consists of a series of frames with the same background. Movies are made by splicing one or more scenes together with professional fade-ins and fade-outs.

Getting started is made easy with an assortment of actors, prerecorded actions, backgrounds and sample movies. The program also comes with a VCR guide for making videos and Movie Disk Maker for creating your own self-booting movie disk.

Take 1 is available for all Apple II+, IIe, and IIc computers with at least 64K of memory, one disk drive, and Applesoft Basic in ROM. A color monitor is not required, but is preferred. Take 1 costs approximately $60 and is available through Baudville High Performance Software, 5380 52nd Street, S.E., Grand Rapids, MI 49508. For more information, call (616) 698-0888.

Cross Country USA

Cross Country USA puts students in the seat of a long-distance truck. As long-distance truckers, students learn map reading skills, calculate distance and time, enhance decision-making skills, identify geographic landmarks, locate major economic resources, and experience the business side of the trucking industry.

Cross Country USA begins with a notice from the dispatcher telling the students how many commodities they will need to collect. Based on information, students must decide the most economic and efficient route to thecity where the commodities are located. Along the way, they must buy gas, eat, and sleep. While driving between cities, they view impressive graphics representing different parts of the country. For example, while traveling through the Appalachian Mountains, students see mountains and trees. The screen also displays the speed, gas level, time, and mileage. Along the way, students can experience various weather conditions, possibilities of accidents, and troublesome mechanical difficulties.

Cross Country USA comes complete with detailed documentation, a map of the United States showing cities

(continued on page 6)

Cross Country

(continued from page 5)

and distances, and several trip planning sheets. The program keeps track of time and expenses throughout the trip, and can be customized to select which commodities students will collect and reassign them to the cities of the instructor's choice. The starting and ending cities, along with the time of the year can also be chosen by the instructor and assigned.

Cross Country USA is available for all Apple II series computers having at least 64K of memory and one disk drive. A color monitor enhances the graphics dramatically. The program is also available (September, 1990) on IBM and IBM compatibles. Cross Country USA will run on IBM having 512K of memory and one disk drive. The Apple version costs approximately $50, while the IBM version costs about $60.

Cross Country USA is available through Didatech Software Limited, 3812 Williams Street, B.C. Canada C5C 3H9. For more information, call 1-800-665-0667.

Action/Reaction

(continued from page 4)

Have one student stand one-hundred and fifty feet away from the launch site. Looking through the sight on the tracking device (see illustration), the student will follow the bottle until it reaches its highest point. Next, the student should carefully read the angle indicated on the protractor. Once known, they should look up the angle on the tangent chart. To determine the altitude, multiply the tangent by the distance from the tracker to the launch site. For example, if the angle was 35 degrees at the highest point and the tracker was 150 feet from the launch site, the bottle reaches a height of 105 feet (.70 x 150 ft. = 105 ft.).

4. Connect a tire pump to the truck tire valve. Fill the bottle with 60 pounds of pressure. Once filled, disconnect the pump.
5. Move to the end of the string attached to the trigger latch. Check to see that the altitude tracker is ready and in position. Also, be sure everyone is at least twenty feet from the launch site.
6. When all is clear, begin a count down from ten to zero. At zero, pull the trigger latch. Using the directions outlined earlier, determine the height of the flight. How high did the bottle go? _____
7. Repeat steps 3 through 6 and modify each launch as follows:
   a. Add 80 pounds of pressure to an empty soda bottle. How high did the bottle go? _____
   b. Fill the bottle 1/4 full of water and add 60 pounds of pressure. How high did the bottle go? _____
   c. Fill the bottle 1/4 full of water and add 80 pounds of pressure. How high did the bottle go? _____

Activity Analysis:

Upon the completion of the demonstration or activity, have students answer the following questions based on their experience.

1. Explain why the bottle went up when released.
2. Adding water, the bottle went a) higher, b) lower, or c) the same. Explain why.
3. What is the relationship between the pressure inside the bottle, the water, and the height of each flight?
4. In terms of a propulsion system, explain how this activity relates to various transportation vehicles like jet aircraft, the space shuttle, and jet skis.

TECHNOLOGY TODAY NEWS

Franzie Loepp, Editor

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Technology News Today
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Illinois State University
Normal, IL 61761

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TECHNOLOGY TODAY NEWS

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Interdisciplinary Technology Education is Effective

Teaching junior high/middle school level can be very challenging because students are at an awkward stage in their physical, emotional, cognitive, and social development. To better address the special needs of early adolescents, many junior high and middle school educators are evaluating their school's organizational structure, curriculum, instruction strategies, and guidance program.

One of the common problems being identified by junior high/middle school educators is curriculum fragmentation. As a result of dividing the curriculum into separate subjects, students tend to perceive their subjects as disconnected collections of facts. To help students discover the interrelationships between the basic disciplines, some teachers are trying to make their classes more interdisciplinary.

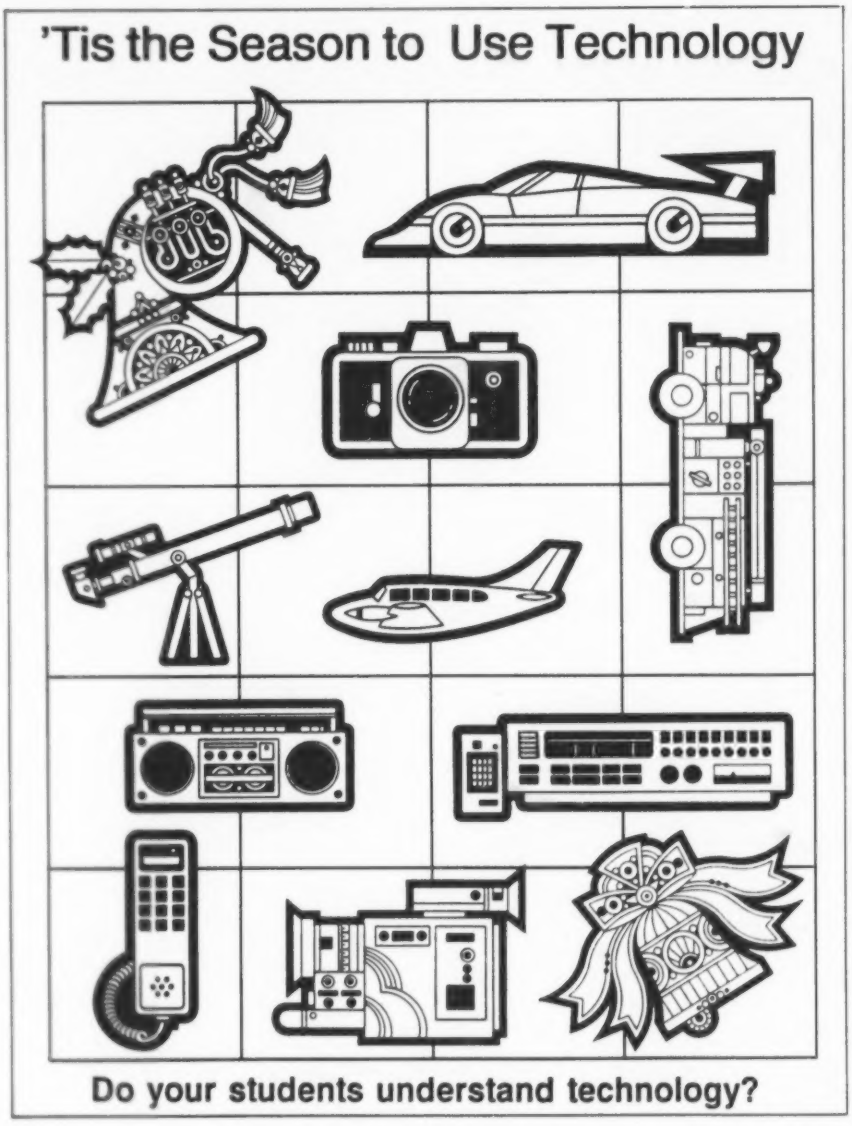
One popular strategy for facilitating interdisciplinary education is to structure learning experiences around themes that are relevant in the lives of students and embrace concepts from a variety of subjects. Technology is an excellent topic for thematic education because it is intrinsically interdisciplinary and young people are typically interested in the technological aspects of their world.

During the 1989/90 school year, eight teachers at Central Junior High School in Monmouth designed and implemented a series of technology-based thematic units. The goals were to help students recognize relationships between school subjects, apply concepts from various subjects to everyday problems in the world of work, explore a wide range of careers in the community, and develop technological and scientific literacy.

In industrial arts class, Terry Bethel provided students an opportunity to apply physical science and mathematical principles while building and testing electrical circuits. In addition to learning about safety, Ohm's law, basic electrical circuits, and electrical hardware, students learned how to work as a team to solve problems, developed fine motor skills, and experienced a potential occupation.

Inspired by the California Raisins, Kathy Lowe Arthur had her art students develop an animated slide series featuring clay circus characters. In the process, they explored careers in the performing arts and learned a variety of history, drama, animation, sculpture, mathematics, and photography concepts. Their production process included researching circus history, experimenting with various animation techniques, developing story boards, establishing a table-top set, sculpting circus characters, lighting and photo-

(continued on page 6)



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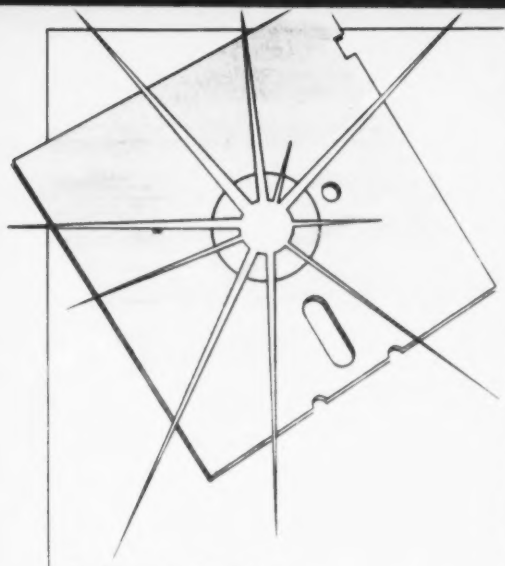


Software Review

The Image Studio

It has been said "a picture never lies." With a software package like Image Studio, this phrase is soon to be obsolete. Image Studio can enhance and touch-up all types of digitized images. Whether the image comes from a scanned picture, video, clip art, or popular paint and drawing program, Image Studio can improve and enhance the picture's appearance. The software includes a Tool Palette which can be applied to a wide range of retouching situations. A Pen Palette allows easy access to a variety of pen shapes and sizes. In addition, the program provides seven fully editable viewing sizes. This feature allows the user to view and modify an entire image or retouch detailed elements down to a single gray scaled pixel, as well as, display more than one view at the same time. The program also supports 256 shades of gray. You can adjust the contrast and brightness of a scanned photo to sharpen detail, bring out highlights, and hide unnecessary portions. With Image Studio you can import and export files in various formats including EPS, PIFF, Thunderscan, RIFF, and MacPaint.

Once the image is edited, modified, and enhanced it can be reproduced using a dot matrix or laser printer. Since the changes are done electronically, it is virtually impossible to tell the new version from the original image.

Image Studio is available for the MacIntosh Plus or higher computer systems with at least one megabyte of memory. Additionally, a hard drive is recommended. Image Studio costs approximately $140 and is produced by Letraset, 40 Eisenhower Drive, Paramus, New Jersey, 07653. For more information, call (201)845-6100.

The New Print Shop Companion

Just about everyone has heard of The Print Shop. After all, with over two million copies in use, it is the best-selling software program of all time. How can its publisher improve on a product that has been credited with initiating today's electronic publishing industry? They created The New Print Shop Companion for IBM and Tandy computers and 100% compatibles. The program is designed to complement The New Print Shop, which allows users to electronically create personalized signs, banners, stationery, and greeting cards by combining type and graphics.

The New Print Shop Companion includes the following new features: Page Publisher, a versatile entry-level page design program includes special templates and typefaces that make it easy for users to produce quality reports, newsletters, and flyers. Letter Writer, provides users a text editor for typing letters on letterheads they have created with The New Print Shop. Envelope Maker, a brand new feature that lets users create beautiful envelopes to match their Print Shop letters and greeting cards. Expanded editors make it easy to design monochrome graphics, borders, and fonts to use with The New Print Shop.

Other features include a new Graphics Importer that lets users import drawings from popular paint programs and Cataloger, a special utility for printing reference pages for graphics, borders and fonts. Together, these exciting new features make this software package a "must buy" for owners of The New Print Shop.

The New Print Shop Companion will run on an IBM or 100 percent IBM compatible computer equipped with graphics card, DOS 2.11 or higher, 640k of memory, and a monochrome monitor. To print graphic products in color, your computer will need a color monitor, a hard disk drive, and a popular color printer. The program is available in 5 1/4" or 3 1/2" diskette formats and costs approximately $50. It is published by Broderbund Software, P.O. Box 12947, San Rafael, CA 94913-2947. For more information, call (800) 521-6263.

The New Print Shop

An old favorite, The Print Shop, has recently received a facelift. First released in 1984, the original Print Shop pioneered an entirely new category of software by enabling users to create personalized greeting cards, signs, stationery, and banners by combining type and graphic elements. Broderbund Software, the publisher, is once again setting a new standard. With the same simplicity and ease of use as the original, the New Print Shop sports more than 20 new major features and enhancements. Some of the most significant changes are: 1) a completely new assortment of high resolution graphics saved in a multiple of sizes; 2) an improved interface allowing users to make changes during design without repeating steps; 3) the ability to place multiple graphics and fonts anywhere on the page; 4) WYSIWYG (what you see is what you get) preview that allows users to see how an overall design looks at any time.

Other new features include a calendar-maker with daily, weekly, monthly, and yearly format. Additionally, the New Print Shop can also be used to produce giant wall-size calendars and signs up to 9 feet by 6 1/2 feet.

The New Print Shop is available for Apple IIc and IIe computers with 120K memory, either a 5 1/4 inch or 3 1/2 inch disk drive and a printer. In addition, the program is available for IBM and Tandy or 100% IBM compatibles with 512K of memory, a disk drive, and a printer. The IBM version also requires PC DOS or MS-DOS 2.1 or higher. The New Print Shop costs approximately $50 for the Apple Version and $60 for the IBM Version. The New Print Shop is produced by Broderbund Software, P.O. Box 12947, San Rafael, CA 94913-2947. For more information, call (800) 521-6263.

The Industrial Technology Education Workshop Series for 1990-91 is Off and Running

During the fall of 1990, six Communication Technology workshops were held throughout the state. Responses to the activities and the curriculum materials provided have been very positive. One Arlington Heights participant commented, "The workshops help see what other teachers are doing. Everybody should attend one or two of these workshops a year." Other participants have summarized the workshops as "an excellent source of information" and "a good experience for those involved directly in the teaching end of technology."

Energy Utilization Technology Workshops

With the series of Communication Technology workshops complete, preparations are now being made for the Energy Utilization Technology workshop series. Seven sites will be utilized to facilitate the workshops. Participants will interact with current energy topics like passive and active solar energy, geothermal power, hydroelectric power, and recycling. As in earlier workshops, teachers will receive current curriculum materials and hear from teachers in the field who are presently teaching energy-related topics.

There is still time to take advantage of the upcoming Energy Utilization workshops, so plan now to attend a workshop in your area. For more information, contact Dennis Gallo at (309)438-2610.

We Need You

A popular part of this year's Communication Technology workshops was a session where one or two teachers shared how they teach Communication Technology. Through the experience, participants received a first-hand look at how teachers in the field have adapted the curriculum to fit the needs of their students and teaching situation. In addition, teachers had the opportunity to see and hear how others have implemented various classroom activities.

The response to the session was so good, it will be continued for the Energy Utilization workshop series scheduled this spring. But, to continue this activity, we need your help. Please volunteer your help, or offer your suggestions for teachers who are currently teaching topics related to Energy Utilization (e.g., energy conversion and transmission, fossil fuels, energy conservation, alternative energy systems, solar energy).

For your participation, you will receive round trip mileage and a $75 stipend. Your school will be reimbursed for the cost of a substitute. For more information, contact Dennis Gallo at 309-438-2610.

Keeping in Touch

The following conferences offer teachers the opportunity to up-date their teaching skills, be exposed to new activities and curriculum materials, and an occasion to interact with other collegues:

IVA/IITEA	February 14-16, 1991 Hotel Pere Marquette Peoria, Illinois

For more information, contact Gene Willimann at 217/224-3770, Ext. 329.

ITEA	March 17-20, 1991 Salt Lake City, Utah

For more information, contact Kendall Starkweather at 708/860-2100.

Do not miss the chance to stay in touch with the latest happenings in Industrial Technology Eduation by making plans NOW to attend a state or an international conference this year.

ENERGY UTILIZATION TECHNOLOGY WORKSHOP PRE-REGISTRATION FORM

NAME _____ SCHOOL _____ PHONE (___) _____

STREET ADDRESS _____ CITY _____ STATE _____ ZIP _____

ENERGY UTILIZATION TECHNOLOGY

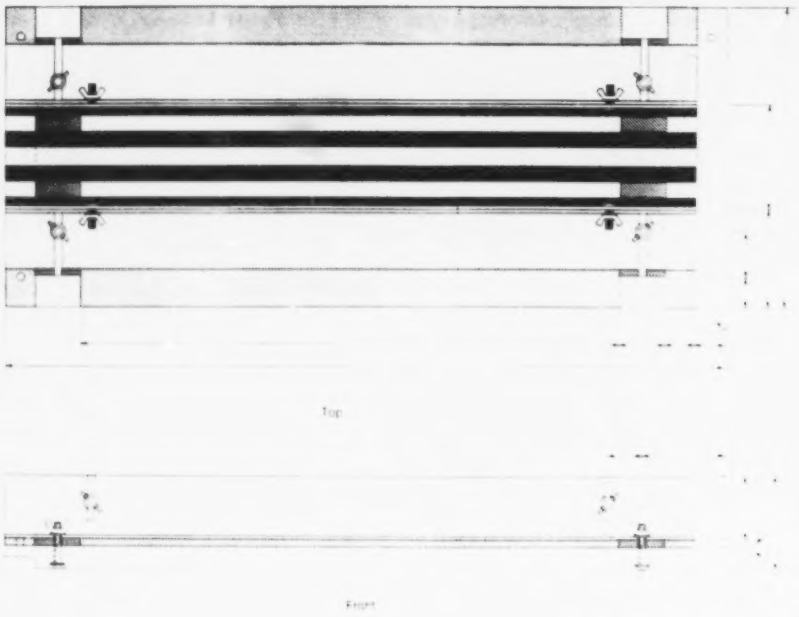
	DATES	TIME	LOCATION
☐	Feb. 6, 1991 Pre-reg. by Jan 23	9:30 am-3:00 pm	Mt. Vernon H.S. Mt. Vernon
☐	Feb. 21 Pre-reg. by Feb. 7	9:30 am-3:00 pm	Forest View Ed Center Arlington Hts.
☐	Mar. 1 Pre-reg. by Feb. 15	8:30 am-1:00 pm	Galesburg High School Galesburg
☐	Mar. 6 Pre-reg. by Feb. 20	9:30 am-3:00 pm	Springfield Area Voc. Center, Springfield
☐	Mar. 13 Pre-reg. by Feb. 27	9:30 am-3:00 pm	Rock Valley Col Tech Center, Rockford
☐	Apr.11 Pre-reg. by Mar. 28	9:00 am-3:00 pm	H. L. Richards H.S. Oaklawn
☐	April 17 Pre-reg. by Apr. 3	4:30 pm-8:00 pm	Dunbar Voc. Center Chicago

Pre-Registration Information

** Please send Pre-registration form and a $15.00 check per workshop, **payable to Illinois State University** to:

Dennis Gallo, 210 Turner Hall,
Illinois State University, Normal, IL 61761.

Please take note of pre-registration deadline.



Sample MAGLEV Test Track Section

MAGLEV Vehicles: Likes Don't Attract

Introduction:

Rail transportation has been used for over a century to move people and goods from place to place with traditional rail systems using a set of parallel steel tracks. But because of the growing need for quicker and more efficient methods for moving people and goods, researchers have turned to a new technique, one using electromagnetic rails and trains. This rail system, referred to as a magnetic levitational vehicle (MAGLEV), uses electromagnets. MAGLEV trains run silently, hovering inches above the track's magnetic field and, because there is no track friction, the trains are capable of reaching speeds in excess of 300 miles per hour. Plans are currently being considered to connect Los Angeles and Los Vegas with a magnetic levitational transportation system, capable of speeds of nearly 250 miles per hour.

This technology-based activity will allow students the opportunity to design, build, and test a magnetic levitational transportation system. Through the experience, students will explore the scientific law of magnetism which states: "Like poles repel; opposite poles attract."

Materials and Supplies:

In order to expand the problem solving capabilities of this activity, each group of two or three students will need a two foot section of MAGLEV track.

The track is designed so that the sections can be linked together when the students are ready for the final test of their vehicle designs. Listed below are the materials needed to construct one two- foot section of MAGLEV track:

A. One piece of plywood or particle board, 3/4" x 10" x 24".
B. 1/4" masonite, 7 1/2" x 21"
C. Four pieces of Plexiglass, 1/8" x 4" x 23". NOTE: Other nonmagnetic materials (e.g., aluminum angle iron) can be used instead of plexiglass.
D. Four 1/4" x 1 1/2" hex bolts with 1/4" washers and 1/4" wing nuts.
E. Four nonmagnetic (brass or aluminum) 1/4" x 1" bolts (carriage bolts if possible) with a 1/4" washer and 1/4" wing nut.
F. Two pieces of 1/8" plexiglass or tempered masonite, 1 1/2" wide by 23" long.
G. Four strip magnets 1/4" x 1/2" x 23", poled on opposite sides. This type of magnet can be obtained through various venders (e.g., Pitsco)
H. Two pieces of masonite, 1/4" x 3 3/4" x 23"
I. Access to a 24" strip heater for bending the plexiglass
J. Access to basic building tools and equipment (e.g., a band saw, table saw, radial arm saw, and drill press, wood glue, small finishing nails, etc.)
K. Hot melt glue gun and glue sticks.

Construction materials for MAGLEV vehicle

Provide each group of two or three students access to materials like:

L. Various types of easy-to-form construction materials (e.g., white pine, balsa wood, floral styrofoam blocks, cardboard, foam core, etc.)
M. Various magnets (e.g., strip, bar, square, circular)
N. Straws
O. Balloons
P. Various compression strings
Q. Rubber bands
R. Hobby motors
S. Various sizes and styles of model airplane propeller blades
T. Batteries

NOTE: Since this is a problem solving activity, many other materials may be added to the list above in order to stimulate the student's creative thinking and enhance vehicle design.

Making a MAGLEV Test Track:

NOTE: Below is a description of the procedures to build a two foot MAGLEV track section. Each group of two or three students can be assigned a two-foot section test track. When ready to conduct a final test run, the track sections can be linked together and modified to reflect the group's design.

1. Begin by cutting a 3/4" piece of plywood or particle board to a width of 10" and a length of 24".

(continued on page 5)

MAGLEV Vehicles:

(continued from page 4)

2. Next, using the illustration as a guide, cut two 3/8" x 1" rabbit joints at each end of the track section. Make sure one rabbit joint is made on the opposite side of the board from the other.
3. Then, cut four pieces of 1/4" masonite into 1" x 3 1/2" strips. Using wood glue and small finishing nails, fasten one strip to each corner. NOTE: Two pieces should be located on each corner just above the 1" rabbit joint.
4. Once complete, cut two pieces of 1/4" masonite into 3 1/2" x 18" strips. Using the illustration as a guide, position and fasten one strip on each side of the track.
5. The bottom set of magnets are designed to be adjustable. This is done by using two sets of slides that can be moved in and out. NOTE: Each slide is made from a 1/4" x

   3 3/4" x 23" SINGLE PIECE of masonite. Using the drawings as a guide, carefully cut two setsof slides to shape. When finished, the tabs on the slides should match the spaces between the masonite on top of the track. Modify the slides as needed. Next, center and cut a 5/16" notch 2 3/4" deep in each of the four slide tabs. Finally, cut two strips of magnet 23" long. Using a hot melt glue gun, run a bead of glue the length of each magnet. Once finished, carefully fasten the magnets to the slides. NOTE: Be sure the side of the magnet facing up is poled the same.
6. Using the Illustration as a guide, locate and drill four 5/16" holes for the bolts. Countersink the holes on the bottom side of the track so the heads of the hex bolts will fit flush.
7. Next, cut four pieces of 1/8" plexiglass 4" x 23". Two pieces of plexiglass will be used for designs that have magnets on the sides of the track (as shown in the illustration). Two other pieces of plexiglass will be used for designs that do not have magnets on the sides (not illustrated).
8. First, make the side rails without magnets. Begin by cutting two 5/16" wide notches. Using the illustration as a guide, measure and cut the two notches along one side of the plexiglass. Notice the notches on the side rails should line up with those on the bottom slides. The final step is to bend the plexiglass to a 90 degree angle. This can be done using a simple bending jig and strip heater. The jig can be made from a 4" x 4" x 24" block of wood. Using a table saw, center and cut a 3/16" x 2" deep groove the length of the board. Then, using a strip heater, heat the center of the plexiglass. Once pliable, carefully place the plexiglass in the jig and fold it over. Make sure the plexiglass stays square.
9. Next, make the side rails with magnets. Begin by locating and cutting two 5/16" wide notches as described below. Using the illustration as a guide, measure and cut two more 5/16" notches along the opposite side. Then, using the technique described above, bend the plexiglass 90 degrees. Once the rails are complete, cut two pieces of 1/8" plexiglass or tempered masonite to 1 1/2" wide by 23" long. Measure and mark a spot 3 7/8" in and 5/8" down on each end of both pieces. Notice the holes should line up with notches on the side rails. If they do, drill a 5/16" hole at each location. If not, adjust the marks as needed before drilling. To finish the pieces, glue a 23" piece of strip magnet along the bottom edge. Make sure each magnet is poled the same. Attach the two pieces to the side rails with nonmagnetic bolts and wing nuts.
10. To finish the MAGLEV test track section, use the illustration to locate and mark the holes needed for linking the sections together. They are found at each end of the track section in the notched out area. Once located, drill a 1/4" hole at each location. Countersink the two holes which are flush with the bottom.

Activity Procedure:

1. Begin by introducing the students to the laws of magnetism. Explain when a pole of a magnet is placed near another like pole, the two magnets will repel each other. Explain further, when a pole of a magnet is placed near another unlike pole, the two magnets will be attracted to each other. This can be easily demonstrated using two bar magnets and two pieces of string.
2. Since the activity requires students to build a vehicle which is levitated by a magnetic field, take some time and describe the nature of a magnetic field. Different magnetic fields can be demonstrated by using various magnets (e.g., bar, u-shaped, square, circular, strip), a piece of clear transparency film, metal filings, and an overhead projector. With the overhead projector on, place a magnet on the projection surface. Then, place a clear piece of transparency film on top of the magnet. Finally, sprinkle metal filings on the film. Discuss how the various magnets create different shaped magnetic fields.
3. Divide the class into design teams of two or three students. Present each team with the following problem statement:

   Using one section of test track and the materials provided, design, build, and test a magnetic levitational systems and vehicle that will travel a distance of eight feet under its own power.
4. Have each team develop a plan for their test vehicle on a piece of graph paper. You may want to give the students maximum dimensions in order to reduce material cost.
5. Using the plan as a guide, have the students build their design. Time should be spent instructing students in the safe and proper use of any tools and equipment needed to construct the test vehicles.
6. When the vehicle is finished, have the students test their design on the two-foot track section. Once the research team has determined the track layout and vehicle design, have the students link several sections of track together (at least 8 feet). Then, have them lay out the track and test the vehicle. Allow the students to make at least three runs.

Activity Analysis:

After completing the activity, have students answer the following questions based on their experience.

1. What are the advantages and disadvantages of magnetic levitational systems in comparison to other forms of land transportation.
2. What are potential applications of magnetic levitation systems.
3. Explain why the MAGLEV vehicle stays suspended when placed on the track.
4. Explain how electromagnets could be used to propel the vehicle down the track.
5. Set the test track section up according to your group's design. Once complete, tilt it up on end. With track on end, have one group member carefully position the test vehicle in the track. Then, place a piece of plain white paper on the top end of the track. Next, carefully sprinkle small metal filings onto the paper. What happens to the metal filings? Using a pencil and paper, sketch the pattern of the metal filings. Compare your findings with other groups.
6. What are some of the design strategies your team used to maximize the performance of your MAGLEV vehicle? What effect did they actually have on your vehicle's performance? What effect did the position of the test track magnets have on the performance of the vehicle? If you had to do this activity over again, what would you do differently and why?

Interdisciplinary Technology

(continued from page 1)

graphing individual scenes, sequencing slides, integrating music, and presenting their final product to an audience.

Larry Ryner, who teaches mathematics and computer literacy, complemented the art curriculum by introducing students to computer graphics. Using an inexpensive software package, his students composed and printed heat sensitive images that could be transferred onto T-shirts.

Sue Nelson, an English teacher, used an activity period to provide students an opportunity to develop their writing skills by publishing a school newspaper. They produced four issues that addressed current events and important issues in the lives of junior high students. In addition to developing their writing skills, students experienced entrepreneurship, developed interviewing skills, explored careers in journalism, and learned about electronic publishing.

Valerie McManus, a special education teacher, used simple health care tools (e.g., dietary analysis software, anatomical model, stethoscope, blood pressure gauge) to help students learn basic human physiology through hands-on learning experiences. They learned about basic body systems by analyzing their dietary intake and measuring their blood pressure, heart rate, respiratory rate, and temperature.

Using the same health care tools, Judy Standard had her Home Economics students assess their dietary intake and measure vital signs in the context of lifestyle and fitness. To experience careers and processes in the food service industry, students established a fast food enterprise called "Salads and More." They conducted market research, established an organizational structure, applied for various jobs within the organization, developed a menu featuring health food, prepared and served meals for the faculty, conducted a profit and loss analysis, and evaluated their performance.

In Social Studies class, Tom Best's students examined the role of transportation in shaping history and geography, forecasted what transportation will be like in the 21st Century, examined careers in the transportation industry, and used computer simulations to experience cross country trucking. In addition, he challenged students to determine an appropriate vehicle and route to efficiently transport a given commodity from one Illinois location to another.

Sarah Simonson, a Chapter One reading teacher, wanted her students to experience literacy by making their reading and writing activities come alive with hands-on activities. In addition to reading about enterprises, research and development, manufacturing techniques and processes, careers in manufacturing, and much more, students established a mini-manufacturing firm that designed, mass produced, and marketed buttons featuring a new school logo. To enhance understanding and appreciation of the written and spoken word, they analyzed newspaper stories, wrote television commercials and newscasts, and recorded their television programs on video tape.

In addition to hands-on activities, students were introduced to a wide range of careers during field trips to a community hospital, boat manufacturer, newspaper publisher, drama theater, screen printing company, advertising firm, and more. By tapping community resources and the interdisciplinary nature of technology, these teachers were able to establish linkages between their individual disciplines. Furthermore, by integrating career education into the curriculum, they were able to demonstrate how important concepts and skills are in everyday life and the world of work.

TECHNOLOGY TODAY NEWS

Franzie Loepp, Editor

Technology News Today is published for industrial education instructors in Illinois by the Illinois Plan for Industrial Education project through the support of the Illinois State Board of Education/Department of Adult, Vocational and Technical Education.

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The Illinois Industrial Education Newsletter

Volume 6
Number 3
March, 1991

TECHNOLOGY TODAY NEWS

And the Winners are...

You may recall in an earlier issue of TNT, the Illinois Plan for Industrial Technology Education project sponsored a videotape contest. Teachers throughout the state were asked to send in their tapes highlighting Industrial Technology Education programs and/or student-related activities.

It is with great pleasure that we announce the top two videotape contest winners. First place goes to Bruce Logsdon and the Communication Technology students at Litchfield High School.

The winning tape describes the process Mr. Logsdon and his students used to prepare a bi-weekly student news broadcast called "On-line." The broadcast is transmitted throughout the school using the Channel One Network System which allows the news broadcast to be simultaneously sent to seventeen classrooms.

Mr. Logsdon was able to convince local administrators to house the main transmitting unit of the satellite-based system in the Communication Technology lab. This allows the students the opportunity to prepare and broadcast a student-developed program.

Each broadcast requires a great deal of preparation. Because of the complications of a live broadcast, Mr. Logsdon and his students have chosen to prepare their videotape news broadcast ahead of time and then disseminate the program on a bi-weekly basis. The process begins with a week of planning called "Off Week." During Off Week, students identify news stories, assign responsibilities, and shoot the raw video footage.

The second week is called "On Week." The last day of On Week is the broadcast deadline. On Wednesday prior to the deadline, the master track is recorded, and other news segments are edited and added to the program. The entire process takes between 12 to 15 hours for ten minutes of air time.

Through local support and the use of computer technology, the time to prepare the broadcast has been shortened and the quality improved. Using the computer, students are able to create scripts, make a teleprompter, and prepare large easy-to-read cue cards.

In addition to the process description, the winning video includes a recently completed newscast, featuring Anchorperson Theresa Fullingim. The broadcast includes reports on Pearl Harbor Day, the predicted New Madrid earthquake, changes in the morning school cafeteria menu, results from school academic and sports competitions, changes in the semester exam policy, a commercial for a yearbook, and a special report about skateboarding.

The successful broadcast of "On-line" is a culminating effort of several Litchfield Communication Technology students, including Engineer, Karan Schoen; Cameraperson, Dan Ingram; Lights, Mark Hendricks and Todd Libbra; Assistant, Woody Stewart and Kristy Petty; Sports, Adam Favre; and Graphics, Todd Schwehr.

A close second was a video submitted by Ed Schmidt of Putnam County High School in Granville and eighteen Introduction to Technology Education students. Mr. Schmidt's entry is a student-produced music video on why students should stay in school. Each student was asked to think of ten reasons why students should stay in school, then the four best ideas were selected. Using an Apple computer, koala pad, and several popular computer programs (e.g., CADDraw, Type Faces, Graphic Exhibitor), students transferred

(continued on page 5)

Preparing Students for the Twenty-first Century

Advancements in technology have brought broad, sweeping changes to the workplace. Concepts like computer-integrated manufacturing, work cells, statistical process control, just-in-time inventory control, participatory management, ergonomics, employee involvement and customer service, to name a few, have become commonplace in today's corporate settings. Couple these changes with a dramatic shift in demographics, and Illinois could be facing a serious deficit in qualified labor in the near future. The private sector and education must combine forces to ensure that Illinois has the human resources necessary to maintain a competitive edge in the twenty-first century.

One only has to look at the skills demanded by modern business and industry to realize the extent of the educational challenge. The workplace demands a labor force that possesses not only advanced technical skills, but strong academic skills and interpersonal skills and a willingness to continue to learn. A task this formidable cannot be accomplished by vocational-technical educators or academic educators working in isolation from each other and from business.

Illinois educators, both technical and academic, are responding to this challenge with the development of a bold reform concept called Technical Preparation/Associate Degree. Illinois Tech Prep represents a curriculum that integrates college preparatory coursework with a rigorous technical education concentration. It is a planned sequence of courses, both academic and technical, that begins at 9th grade and is articulated with a post-secondary experience leading to an associate degree. Because Tech Prep prepares students for a lifetime of learning, it also provides preparation for advanced education such as a four-year baccalaureate degree. Tech Prep prepares students with the skills and competencies necessary to meet employers' performance standards, not only for entry-level jobs, but also for career advancement.

Tech Prep Students

Although Tech Prep is aimed at attracting a wide range of students, typical Tech Prep students are students who:

- fall between the 25th and 75th percentile of secondary students;
- enjoy using complex math and science concepts to solve problems;
- have an aptitude toward technical/scientific content;
- intend to pursue post-secondary education;
- enjoy learning through the application of academic knowledge and skills;
- desire a challenging, good-paying career and are willing to work toward achieving this goal.

Tech Prep has entrance standards. When students lack the necessary competencies, they will be provided the opportunity to get academic assistance to possibly qualify for and participate in Tech Prep at a later time.

Tech Prep Partnerships

The success of Tech Prep is dependent upon the development of 50/50 partnerships between:

- academic and technical educators
- secondary and post-secondary educators
- educators and representatives of the private sector

A. The Academic/Technical Partnership

To be prepared to succeed in the workplace of the twenty-first century, students will need a strong academic foundation and the ability to apply it. Tech Prep brings academic and technical educators together in a true partnership. These Tech Prep educators eliminate barriers which stand in the way of interdisciplinary cooperation. They are receptive to new teaching methods and design Tech Prep sequences together. For example, a hypothetical Tech Prep sequence might look like the following:

FICTICIOUS TECH PREP PROGRAM FOR ELECTRO-DYNAMIC NUCLEAR TECHNICIAN

	SECONDARY				POST-SECONDARY	
SUBJECT	9TH	10TH	11TH	12TH	FIRST YEAR	SECOND YEAR
ENGLISH	English I	English II	English III[1]	English IV[1]	Technical Communications I & II (6)	
MATH	Pre Algebra[2]	Algebra [2]	Geometry	Algebra II	Trigonometry (3)	Calculus or Statistics (4)
SCIENCE	Physical Science		Principles of Technology	Principles of Technology	Tech Physics or UTC Physics (4)	Nuclear Physical Lab (4)
HUMANITIES	Consumer Education (1/2) Geography (1/2)	U.S. History		Government (1/2)	Orientation to Nuclear Occupations (3)	Humanities (3)
OTHER	Health/PE	PE	PE	PE		Entrepreneurship (3)
TECHNICAL EMPHASIS	Intro to Technology (Ill. Plan for Ind. Tech. Ed.)	Fundamentals of Nuclear Dynamics (1/2)	Electro-Dynamic Theory & Lab	Integrated Electro-Dynamic Systems	Electronic Circuits (3) Nuclear Dynamics I (3) Electro-Dynamic Lab (4) Electro-Dynamic System Analysis (3)	Intro to Microprocessors (2) Microprocessors Lab (4) Electro-Dynamic Internship (6) Electro-Dynamic Internship (6)
RELATED TECHNICAL		Computer Fundamentals (1/2)		Corporate Economics (1/2)	Engineering Problem Solving (3) Human Relations (2)	Nuclear Dynamic Safety (2)
CREDITS	6	5	5	6	34 credits	34 credits

SECONDARY 22 CREDITS — POST-SECONDARY (AAS) 68 CREDITS

[1] Could be Applied Communications for one year
[2] Could be Applied Math I and II
NOTE: All academics taught with an applic[illegible]ns emphasis

Tech Prep educators also jointly design instructional strategies to strengthen the relationship between academic content and application.

B. The Secondary/Post-Secondary Partnership

Tech Prep provides students with opportunities that maximize experiences at both secondary and post-secondary levels. Tech Prep represents a strong linkage between secondary and post-secondary institutions to provide a smooth transition from one level to the next without duplication of effort. The secondary experience is well articulated to the post-secondary program to provide a solid foundation for advanced technical studies at a post-secondary institution.

Articulation also ensures that students can continue, when appropriate, in a four-year baccalaureate program with minimal loss of credit. Ultimately, Tech Prep prepares students to benefit from a lifetime of learning opportunities.

C. The Education/Private-Sector Partnership

A well-prepared future labor force is dependent upon equal commitment from both education and the private sector. Employers working with Tech Prep clearly identify and communicate their performance standards. These standards will include not only technical skills, but also expectations in reading, math, science, and communications.

Tech Prep educators design learning experiences to ensure students meet these expectations and certify that completers are ready to enter the workforce.

Employers must not only identify and communicate performance standards, but be willing to provide incentives to make Tech Prep attractive to students. These standards will include not only technical skills, but also expectations in reading, mathematics, science, and communications. Tech Prep educators design learning experiences to ensure students meet these expectations and certify that completers are ready to enter the workforce.

Employers must not only identify and communicate performance standards, but be willing to provide incentives to make Tech Prep attractive to students. These incentives may include:

- priority hiring considerations or guaranteed employment
- wage and/or advancement incentives
- support for continued work-related training and education
- paid internships or employment for students during the school year or summer while enrolled in a program
- scholarships to post-secondary institutions

In addition, employers inform the public of Tech Prep opportunities and encourage enrollment in the program. Further, they provide training slots and work with educators to ensure appropriate learning experiences.

Tech Prep represents new opportunities: opportunities for educators to restructure curricula to reflect the needs of tomorrow; opportunities for employers to remain competitive in an ever-changing economy; and opportunities for students to prepare for challenging careers in the twenty-first century. Tech Prep completers will motivate self-starters capable of setting career goals and being an asset to their employer. They will be team players able to communicate and solve complex problems in the workplace of tomorrow. Technical Preparation/ Associate Degree completers will ensure that Illinois continues to be a state where industry can locate, grow, and prosper.

What Lies Ahead

Without knowing it, teachers in Illinois have been tooling up to modify their curricula so as to provide a sound foundation for the Tech Prep movement. Fortunately, the technology education courses designed for the ninth/tenth grade do provide a broad overview that will help students move into the more specific and technical eleventh through fourteenth grade curriculum. Now, the challenge will be to articulate the technical courses between the secondary schools and community colleges. Approximately 34 sites in Illinois will be working on this curricular problem during FY 92. So there are challenges ahead of us. Together we can make Tech Prep work for the citizens of Illinois.

ENERGY UTILIZATION TECHNOLOGY WORKSHOPS
PRE-REGISTRATION FORM

NAME _____ SCHOOL _____ PHONE (___)_____

STREET ADDRESS _____ CITY _____ STATE_____ ZIP_____

ENERGY UTILIZATION TECHNOLOGY

DATES	TIME	LOCATION
☐ Mar 1 Pre-reg. by Feb. 15	8:30 am-1:00 pm	Galesburg High School Galesburg
☐ Mar. 6 Pre-reg. by Feb. 20	9:30 am-3:00 pm	Springfield Area Voc. Center, Springfield
☐ Mar. 13 Pre-reg. by Feb. 27	9:30 am-3:00 pm	Rock Valley Col Tech Center, Rockford
☐ Apr.11 Pre-reg. by Mar. 28	9:00 am-3:00 pm	H. L. Richards H.S. Oaklawn
☐ April 17 Pre-reg. by Apr. 3	4:30 pm-8:00 pm	Dunbar Voc. Center Chicago

Pre-Registration Information

** Please send Pre-registration form and a $15.00 check per workshop, **payable to Illinois State University** to:

Dennis Gallo, 210 Turner Hall,
Illinois State University, Normal, IL 61761.

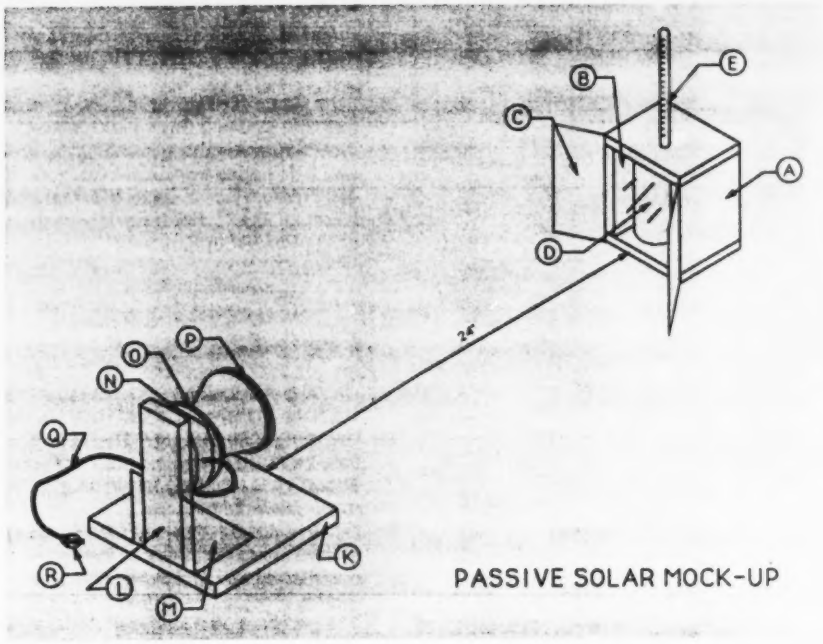
Please note pre-registration deadline.

Passive Solar Energy

Introduction:

The sun is one of the most abundant energy sources. One way to capture the sun's inexhaustible resources is through the use of passive solar energy techniques. Passive solar energy is the collection, storage, control, and distribution of the sun's radiant heat without the use of fans, motors, pumps, or electrical energy. Passive solar energy systems can achieve solar gain through direct or indirect means. In a direct passive solar collection system, the solar energy enters through the glass and into the living space. The thermal mass is inside the living space. In an indirect system, solar energy must pass through glass and a thermal mass before entering the living space. The thermal mass is located between the glass and the living space.

During this Technology Education Activity, students will construct and test a simple passive solar collector.



PASSIVE SOLAR MOCK-UP

Materials and Supplies:

Provide each group of two students the following materials:

A. (5) pieces of rigid foam insulation (e.g., Thermax, Tuff R) 1/2"x 3 7/8"x 4 7/8"
B. (1) piece of 6 mil. polyethylene plastic (vapor barrier), 7"x 8"
C. (2) 6"x 3" side reflectors (heavy duty or commercial grade aluminum foil, glued to poster board with contact cement)
D. (1) soda can painted flat black, flat white, or flat gray. Provide each group with a different colored can.
E. (1) Thermometer (with a range of 0 degree Celsius to 150+ degrees)
F. (1) roll of duct tape
G. (1) hot melt glue and glue stick
H. Calculator
I. Scratch awl
J. (1) assembly fixture (see illustration)
K. (1) piece of plywood, 3/4" x 8" x 8"
L. (1) piece of wood, 3/4" x 2 1/2" x 8"
M. (2) triangular pieces of wood, 3/4" x 4" x 4".
N. (1) octagon shaped electrical box
O. (1) porcelain light fixture
P. (1) 150 watt spot light bulb
Q. (1) 36" length of 3-wire service cord
R. (1) electrical plug

Note: Several popular software packages (e.g., Science Tool Kit, Playing with Science: Temperature, Exploring Science: Temperature) can be used to enhance the passive solar activity by keeping track of temperatures and graphically displaying the results.

Making a Passive Solar Collector:

1. Using the assembly fixture, rigid insulation, and the illustration as a guide, construct a five-sided box. Once in place, use pieces of duct tape to hold the sides together. Be sure to keep the box as square as possible.
2. Next, use the hot melt glue gun to fasten the bottom of the soda can to the inside of the collector. Note: Be sure the can is centered and the hole on top of the can is facing toward the front (open side) of the collector.
3. Once the soda can is in place, tape a piece of clear plastic over the front of the collector.
4. Using the illustration as a guide, tape the two reflectors to the sides of the collector. The reflectors should be fastened like a hinge, thus, allowing them to be moved to various angles and positions. Note: Be sure the side with the aluminum on it is facing toward the front of the collector.
5. Using a scratch awl, make a small hole in the top of the box. Note: Make sure the hole on top of the box lines up with the hole in the soda can.

Activity Procedures:

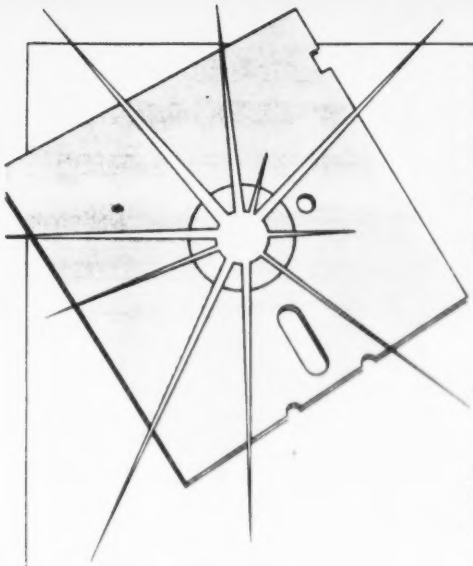
1. Explain to the students that passive solar energy systems consist of four basic subsystems: collection, storage, control, and distribution. Discuss collecting passive solar energy is accomplished by allowing the sun's radiation to pass through glazing material such as glass and plastic. The glazing material prevents the heat from escaping back in the open air (e.g., heat builds up inside a closed car during the summer). The heat passes through the glass windows and is trapped inside.

To store passive solar energy, there must be some type of thermal mass. Thermal mass describes a variety of building materials (e.g., rock, brick, sand, water, cement) which have the ability to store heat energy and then give off the heat as the temperature drops. Explain further, color plays a roll in the material's ability to absorb heat. Dark colors absorb more heat. Therefore, using dark colors in combination with thermal mass will increase the effectiveness of the storage material.

Passive solar energy can be controlled by regulating the amount of sunlight allowed into the collector or venting unwanted heat out of the system. There are several ways to control the amount of light allowed into the collector. Houses can be regulated by covering windows with shades, blinds, or roof overhangs. Vents can be opened or closed in order to regulate temperature and the movement of air inside the house.

Through the use of natural convection and conduction, solar energy can be distributed through the structure without the use of pumps or fans.

(continued on page 6)



Software Review

PC Paintbrush IV

PC Paintbrush IV will allow students the opportunity to explore the editing and creative power of the computer. This low-cost program allows students to create, refine, and retouch images. Using tool box features students can draw lines, curves, circles, ellipses and boxes. Additionally, students can define cutouts, airbrush images, create text, choose from 256 on-screen color shades, and erase all or parts of a drawing.

PC Paintbrush IV is not just another drawing program. It contains a variety of retouching and enhancement features, including the ability to overlay two images, adjust the image's size, tilt or flip the image, and change the tint. Further, students can lighten, blur, darken or adjust the image contrast and blend new elements with existing backgrounds. With the new "tiling" feature, students can create 3-D effects, pictorial charts, and intricate patterns. This feature allows students to graduate colors and shadow letters. The editing features can be used on both existing images and imported graphics from other popular graphics programs.

PC Paintbrush IV requires an IBM or compatible, PC/XT, PC/AT, or PS/2 with at least 384K of memory. For best results, 640K of memory is recommended. Additional system requirements include two 640K floppy disk drives or one floppy disk drive and a hard drive, DOS 3.0 or higher, graphics monitor, pointing device and printer. The program costs approximately $80 and is available from ZSoft Corporation, 450 Franklin Road, Suite 100, Marietta, Georgia 30067. For more information, call (404)428-0008.

EasyCAD2

Are you looking for a way to expose students to the concept of CAD without depleting your budget? Then EasyCAD2 may be the software program for you. Though it is relatively low in cost, it offers many powerful features.

EasyCAD2 allows students to create entities using geometric drawing commands like circles, variable line widths, arcs, ellipses, and polygons. The program also features associative dimensioning, fillets, chamfers, splines and various arrays. Once created, entities can be selectively filled with solid colors or crosshatch patterns. Drawings can also be easily edited. EasyCAD2 includes editing commands like erase, break, move, scale, copy, rotate, and mirror.

Drawing files created using EasyCAD2 can be exported to other popular page layout programs like PageMaker and Ventura Publisher. In addition, files can be both imported and exported with other popular computer-aided drafting programs like AutoCAD, DataCAD, and FastCAD.

All this power comes in an easy-to-use format. EasyCAD2 utilizes pull-down menus, dialogue boxes, and logical commands to help students get started fast. In addition, the program comes with several sample drawings and a well written user's manual, including easy-to-follow tutorials.

EasyCAD2 is available for IBM and compatible PC, AT, PS/2, or 386 machines with DOS 2.0 or higher. Additional requirements include 512K of memory, two floppy drives or one floppy and a hard drive, graphics adapter, monitor, mouse or digitizer and a plotter or printer. Optional equipment includes a math co-processor. EasyCAD2 is available for approximately $150 through Modern School Supply Inc., P.O. Box 958, Hartford, Connecticut 06143. For more information call 1-800-243-2329.

CalendarMaker

Are you tired of students coming up to you each day and saying, "What are we doing today?" Or, are you just looking for a new creative way to organize your thoughts and classroom plans? Well, the software program, CalendarMaker, may be just for you. With CalendarMaker, you will be able to create your own personal calendars. Calendars can be made to display one month or two on a single sheet of paper. In addition, you can format your calendar's weeks; Sundays through Saturday or Monday through Sunday. Other features include the ability to input graphic icons to highlight special events, create floating notes to draw people's attention to specific days, and preview the page to see how the text and graphics fit together. Once finished, the calendar can be converted to a PICT file and imported to your favorite page layout program, (e.g., PageMaker) or word processing program (e.g., Microsoft Word, WordStar, MacWrite). Prints can be made using a Laserwriter or Imagewriter printer.

Just imagine, developing a creative calendar-styled syllabus for each of your courses. Each calendar could include topics to be discussed, or topics to be covered, when major assignments are due, and vacation days. This information can be given to students and/or enlarged and posted on a classroom wall bulletin board.

CalendarMaker is available for the MacIntosh 512, 512E, Plus, SE, and II, with a single disk drive, and 128K of memory. Additionally, the program requires a printer. The program is available through C. E. Software, Incorporated, 1954 Fuller Road, Box 65580, West Des Moines, Iowa 50265 for approximately $30. For more information, call (515) 224-1995.

(continued from page 1)

their ideas into video pages. Each video page includes a slogan and an eye-catching graphic.

To make the video, the designs were displayed for five seconds, and the images captured using a VCR. Appropriate music was selected and dubbed with the video, resulting in an upbeat, eye-catching presentation music video.

Students involved in the project were :

Sam Abraham
Heather Brown
Neil Gaulandi
Heath Jeppson
Kory Kettman
Brian Burress
Bob Anderson
Damon Burress
Dan Cadwallader
Floyd Jones
Brent LeDuc
Brian Pruess
Nick Romak
Jaime Sanchez
Bill Sanders
Brent Rose
Joe Sanchez
Josh Yopchick

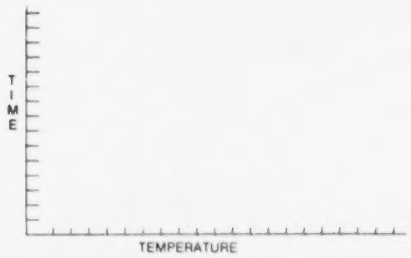
For his first place efforts, Bruce Logsdon received $200, and for second place, Mr. Schmidt received $150.

(continued from page 4)

2. After reviewing major concepts, place a thermometer into the top of the collector, positioning it so the numbers can be easily read. Note: The thermometer should go through the top of the collector and into the can, but should not touch the bottom of the can.
3. Using the illustration as a guide, place the collector 24 inches from and facing directly at the light source. Finally, adjust the side reflectors. Note: This activity can be conducted outside, weather permitting. If so, position the collector so it faces the sun.
4. Using the chart below, record the temperature every two minutes for fourteen minutes.

Reading	Celsius/Fahrenheit
#1	____/____
#2	____/____
#3	____/____
#4	____/____
#5	____/____
#6	____/____
#7	____/____
#8	____/____

5. In between readings, convert the Celsius readings to Fahrenheit using the following formula:



Degrees in Fahrenheit =
9/5 x (degrees in Celsius) + 32.

English statement of the formula:

Degrees in Fahrenheit equals 9/5 times the degrees in Celsius plus 32.
For example: A Celsius reading of 75 degrees equals 167 degrees Fahrenheit (75 x 9/5[1.8] = 135; 135 + 32 = 167).

6. After collecting the data, use the graph provided to display your results.
7. Once finished, use the data collected to compare your results with other groups.

Activity Analysis:

Upon the completion of this activity, have students answer the following questions based on their experience.

1. Describe the effect different colored soda cans had on the temperature inside the collector.
2. Describe what happens to the temperature inside the collector when a thermal mass is added to the soda can.
3. Discuss several advantages and disadvantages of passive solar energy.
4. Discuss how passive solar energy can be used in real-world applications.
5. Based upon your experience, which of the following collectors would you predict will have the highest, second highest, and lowest heat gain.

Problem Statement:

There are three passive solar collectors positioned in the sun. Each collector is constructed the same, with one exception. The interior of each collector is painted with a different color of flat paint. Collector #1 is painted yellow; collector #2, red; and collector #3, white.

HEAT GAIN/PREDICTION

1. Highest _____
2. Second highest _____
3. Lowest _____

TECHNOLOGY TODAY NEWS

Franzie Loepp, Editor

Technology News Today is published for industrial education instructors in Illinois by the Illinois Plan for Industrial Education project through the support of the Illinois State Board of Education/Department of Adult, Vocational and Technical Education.

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Dennis Gallo, Executive Editor
Technology News Today
Department of Industrial Technology
Illinois State University
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TECHNOLOGY TODAY NEWS

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Wheeling High School Technology Education Complex: Changing the Image of Industrial Technology Education

Over the past ten years, industrial education teachers in Illinois have been involved with curriculum reform. Teachers throughout the state have revised their traditional course offerings to reflect a technology-based curriculum. While most feel comfortable with changes utilizing existing facilities, others feel the image of industrial technology should also be reformed. There is a growing number of teachers and administrators who feel industrial technology education should be more appealing and accessible to the general school population. Given the opportunity, many school systems have opted to not only update the curriculum, but also update their image, mainly through facility changes. Schools like United Township High School, Danville High School, District 218 (H. L. Richards High School and Alan B. Shepard High School), Bloomington Junior High School, and Reed Custer High School are in the process of revising or have already revised their industrial technology facilities.

One of the state's most comprehensive and ambitious facility and curriculum projects is currently underway in District 214 at Wheeling High School. Next fall, Wheeling High School plans to unveil its newly revised Technology Education Complex, including a Center for Applied Technology (CAT).

As a part of the project, the district will embark on a new instructional delivery system. The focus of the system will be on an applied interdisciplinary approach to learning, incorporating the use of state-of-the-art technology. "We have designed the technology lab in response to the vision we have of developing young people who can think critically and solve problems, acquire knowledge and learn to apply it, communicate effectively, and understand and use technology," said Dr. Steven Berry, Superintendent of District 214. "If we do not provide experiences for students to develop these skills, we will never attain that vision, and our students will not be prepared to successfully compete in tomorrow's world of business and industry."

The Technology Education Complex is being created by revamping the existing facility. The complex will include

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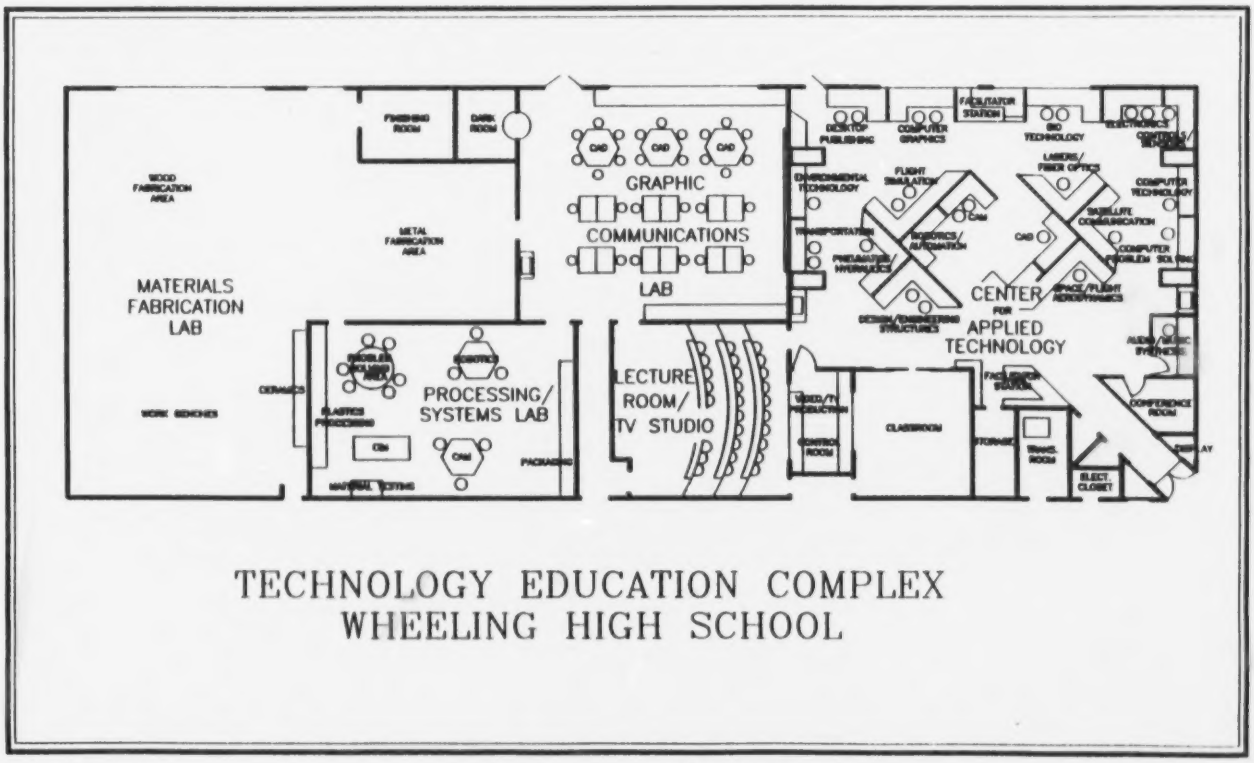


TECHNOLOGY EDUCATION COMPLEX
WHEELING HIGH SCHOOL

Wheeling High School

(continued from page 1)

a lecture forum and television studio with large-screen projection capabilities and a seating capacity for 40 people. Students will use the facility to assemble their own television and video productions, make group presentations, and listen to guest speakers. Portable cameras set up in the center will give students, teachers, and visitors a close-up view of the work being done there. There will also be a graphic communications lab with workstations for computer-aided design and electronic publishing, as well as full darkroom facilities. A processing/ systems lab will enable students to explore robotics, computer-aided manufacturing, packaging, and material testing. Students can take projects from here into the materials fabrication lab where they will find all the tools needed to construct their design.

A unique feature of the facility is the Center for Applied Technology (CAT). "CAT is being planned to look like a professional research and development facility," said Linda Babl, Practical Arts Division Head at Wheeling. The self-contained center will have its own foyer entrance and will be fully air-conditioned and carpeted. The center will have 24 two-person computer-based workstations networked to each other. The 20 initial CAT instructional modules are currently being developed and designed by a team of teachers representing all disciplines and each of District 214's six schools, ranging from electronics and computer-aided drafting and manufacturing (CAD/CAM), laser/fiber optics and robotics. "As technology advances, instructional modules can easily be added and deleted with minimal expense," says Grant Winsauer, Director of Vocational Education and Grants for District 214. "We are learning a new level of use for technology as an instructional tool that was never available to us before. The potential for infusing technology into interdisciplinary instruction and applied learning across all curriculum areas is where the real value lies. Until you see something, you don't really learn it. The Technology Education Complex and CAT will bring the technology of the real world to the students so they can come to know and understand the society they are entering, and gain a more accurate picture of the skills and knowledge they will need to work, as well as career opportunities which lie before them."

Early indicators show the district's effort is paying off in terms of larger student enrollment. With many programs throughout the state showing steady enrollment declines, Wheeling, through its modernization efforts, has seen its enrollment go from 237 students in 1986 to an early enrollment figure of 484 students in 1992, a 204% increase. An Introducing Technology course being offered in the Applied Technology Center, in its first year, has 88 students enrolled and the figure continues to rise.

In addition to offering the students an up-to-date curriculum and an excellent facility, the district hopes to utilize the Technology Education Complex and Tech Center to provide:

- inservice training for the district's technology staff.
- technology literacy inservice for the entire teaching staff.
- an opportunity to train and assist teachers from all instructional areas in the high school in the skills and knowledge required to infuse technology education across the curriculum, and foster applied learning experiences in all instructional areas.
- technology education workshops for technology educators from outside the district.
- technology education programs for community members through the district's community education program.

District 214 is not stopping with the completion of the new facility at Wheeling High School. Plans are to duplicate similar types of complexes at five other district high schools.

Inservice Courses Offered for Technology Education Teachers

WESTERN ILLINOIS UNIVERSITY

- IE&T 275 Industrial Work Experience
- E&T 407 Computer Graphics for Industrial Applications
- IE&T 493 Industrial Internship
- IE&T 217 Electronic Desktop Publishing
- IE&T 456 Fluid Logic and Circuit Design
- IE&T 482 Fundamentals of Computer Aided Design
- IE&T 417 Electronic Desktop Publishing II
- IE&T 522 V.I.P.

For more information concerning the dates, locations, and credit hours, please contact Thomas Bridge, 309/298-1091.

EASTERN ILLINOIS UNIVERSITY

- INT 5970, Section 121 International Competition in Manufacturing and Education
- INT 4943 Manufacturing Management
- TED 5163 Contemporary Problems in Technology
- INT 4980 Computer Controlled Machining
- INT 5970 Quality and Productivity

For more information concerning the dates, locations, and credit hours, please contact Dr. Gene Strandberg, (217)581-2721.

ILLINOIS STATE UNIVERSITY

- IT 412 Technological Update (International Graphic Arts Education Association Conference Credit)

For more information concerning cost, times, dates, location and course credit, contact Dr. Jane Liedtke, (309)438-7758.

- IT 412.91 Technological Update Introduction to Robotics and Automated Systems

For more information concerning cost, times, dates, location and course credit, contact Dr. Larry Fryda, (309)438-5576.

Congratulations to Local Award Winners

Recently, several teachers and students have received local and national recognition for their hard work. Grant Winsauer, Director of Vocational Education and Grants for District 214 was named Teacher and Teacher Administrator of the Year of the Illinois Industrial Technology Education Association at the February IVA Conference. At the same conference, IITEA awarded Richard Anderson, a teacher at Seneca High School, the Teacher of the Year award. Additionally, Richard Anderson received the Outstanding Teacher of the Year award at the International Technology Education Association (ITEA) Conference in Salt Lake City, Utah.

Other award winners were recognized at this year's Illinois Technology Student Association (ITSA) state conference held at Carlinville, March 21-23. Richard Anderson continued his winning ways by receiving the ITSA's Advisor and Outstanding Chapter of the Year awards. Mulberry Grove High School was a close second for the Outstanding Chapter award. Finally, the Outstanding ITSA Student award went to Guy Sulzberger of Seneca High School.

All award winners are to be commended for their hard work and contributions to the field.

Resources for Industrial Technology Educators

In 1984, Illinois teachers began receiving a new publication called Technology News Today (TNT). Over the years, some 3,000 teachers and administrators have received the quarterly publication. In the beginning, the TNT was a source of information for technology education related curricula and activities. Gradually the TNT expanded its format to include sample learning activities, model industrial technology education programs, information on professional development and inservice opportunities, and computer software reviews. At the close of the TNT's sixth year, in an atmosphere of changing funding priorities, the future of the publication is unclear.

Despite the uncertainty surrounding the TNT, teachers will continue to have access to many great sources of information. One such resource is the TIES (Technology, Innovation, and Entrepreneurship for Students) magazine. Originating out of Drexel University, TIES offers teachers access to new, innovative activities, as well as content related articles for such topics as computer imaging, human power transportation systems, fabric structures, and stereolithography. A free subscription is available by contacting Scott Anderson, Project Director, TIES, Drexel University, Philadelphia, PA 19104. For more information, call 215/895-1679.

For a national and international perspective on technology, teachers can turn to the Journal of the International Technology Education Association (ITEA) called The Technology Teacher. This fine journal is included with ITEA membership. The Technology Teacher contains articles from national and international leaders in the field of technology education. In addition, the publication contains technology-based learning activities, reports on technology education related research, resources in technology, new product information, and up-to-date textbook reviews. For more information about becoming a member of ITEA and receiving the journal contact the International Technology Education Association, 1914 Association Drive, Reston, VA 22091 or call 703/860-2100.

If it's technology-based activities you are looking for, then try the Center for Implementing Technology Education (CITE) at Ball State University in Muncie, Indiana. For a subscription price of $100 a year, teachers receive 100 technology-based activities related to the areas of construction, transportation, communication, and manufacturing. The CITE materials are developed by the Center for Implementing Technology Education, Department of Industry and Technology, Ball State University, Muncie, Indiana 47306. For more information, call (317)285-5659.

To stay informed locally, teachers should consider becoming involved with professional organizations such as the Illinois Industrial Technology Education Association (IITEA), and/or the Illinois Vocational Association (IVA). Both IITEA and IVA offer members a state journal. The journals contain professional development opportunities, state conference information, legislative updates, and articles from teachers and administrators in the field. For information about IITEA, contact Henry Pawlus, Grundy Area Vocational Center, 1000 Union Street, Morris, IL 60450, (815) 942-4390. For information about IVA, contact Karen Brown, Suite 150, 230 Broadway, Springfield, IL 62701, (217)544-0815.

In addition, teachers can find out about statewide matters by contacting the Illinois State Board of Education, Department of Adult, Vocational and Technical Education, Industrial Consultants at (217)782-4877. Industrial Consultants Ron Engstrom, John Kopatz, and Chuck Windhorst can provide information concerning federal and state vocational updates, curriculum and program improvement specifications, and educational workshops and conference dates.

Finally, teachers looking for state and national curriculum materials can contact Randi Maxfield at the Illinois Vocational Curriculum Center, Sangamon State University, E-22, Springfield, IL 62708, 1-800-252-4822. In addition to curriculum materials, teachers will find resources including textbooks, computer software, and videotapes.

On a cost-recovery basis, teachers also can obtain local curriculum materials through the Curriculum Publications Clearinghouse at Western Illinois University, Horrabin Hall 46, Macomb, IL 61455, 1-800-322-3905 or (309)298-1917.

Stay up-to-date! Use these resources. You know technology changes rapidly. If you aspire to teach "technology" you will need to change too!

Coalition for Vocational and Technical Leaders of Illinois Developed

During the last few years many state professional organizations in the vocational and technical areas have developed in Illinois. Although these organizations provide educators opportunity to be involved within their own specialty group, it has also splintered the state with multiple meetings. As most vocational and technical educators are limited to the number of meetings they attend each year, the opportunity of providing in-service and effective communication has become more difficult.

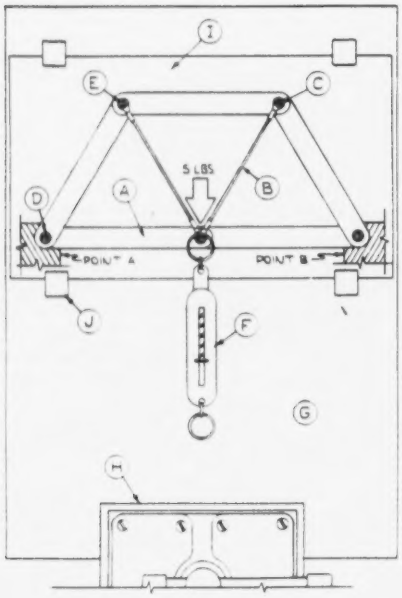
As a result of this need, the Department of Adult, Vocational, and Technical Education provided funds to bring together leaders of state vocational and technical organizations. The purpose of this meeting was to determine if an effective means of providing in-service and communication could be developed. The first meeting was held March 22, 1990 in Springfield. Organizations represented were:

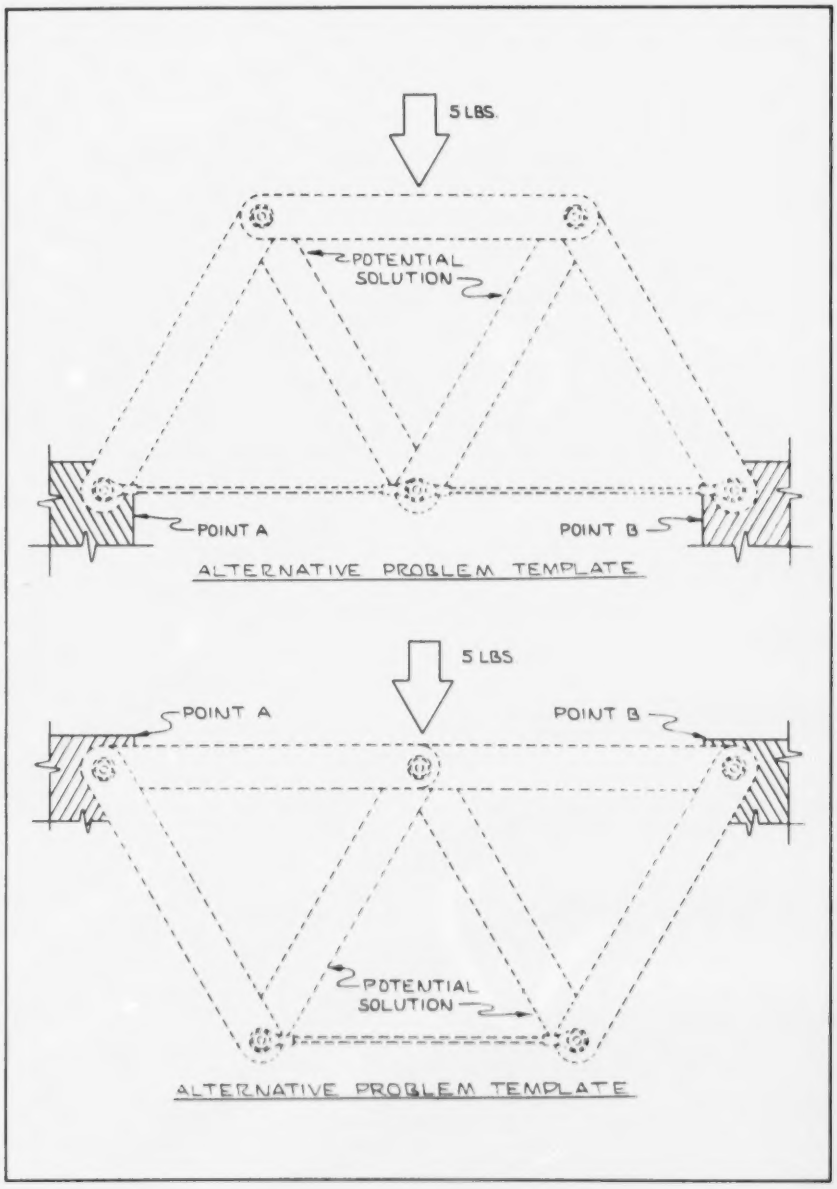
- Illinois Drafting Educators Association
- Illinois Woodworking Teachers Association
- Graphic Arts Teachers Association of Illinois
- Illinois Association of Electricity/ Electronics Educators
- Illinois Vocational Education
- Illinois Council of Vocational Administrators
- Illinois Industrial Teacher Education Association
- Vocational Industrial Clubs of America
- Illinois Vocational Education Personnel Development Association
- Illinois Joint Staff for Industrial Education
- Illinois State Board of Education

At the first meeting the decision was made to develop the Coalition for Vocational/Technical Leaders of Illinois. The purpose of this group is to bring together leaders of Illinois vocational and technical organizations to provide a more effective means of communication. The goals of this group are to:

- Provide better information regarding in-service needs and offerings for vocational and technical educators of Illinois.
- Share membership information and organizational activities for more effective planning and scheduling.
- Disseminate and discuss information regarding state and federal legislative concerns related to vocational and technical education.
- Share related information through the individual organization's newsletter, memos, and professional meetings.
- Coordinate organizational meetings when possible to eliminate conflict and crossover.

The coalition held three meetings during the 1990-91 academic year. A fall meeting is being planned to determine directions for next year.





Sticks, Strings, and Structures

Introduction:

Truss bridges, antenna towers, power line pylons, geodesic domes, and roof trusses are all structures designed to withstand a variety of forces. To carry and distribute these forces, many structures are comprised of a network of triangular frames that work together to transmit the load to the earth. During this load distribution process, various parts of each triangular frame undergo compression and tension.

A structural member is under compression when external forces try to compress, squash, or shorten it against other structural elements. The internal forces created by the interactions of millions of atoms and their bonds within the structural member repel the compression by pushing outward against neighboring structural elements. In contrast, a structural member is under tension when external forces try to pull it apart while the bonds that hold the atoms of the material together are pulling inward. Identifying which structural members are under compression and which are under tension depends on where external forces are being applied and how the triangular frames are arranged.

Framing members that are designed to withstand compression forces are sometimes called struts and framing members that are designed to withstand pulling or tensile are sometimes called ties. While struts need to be made of rigid materials like steel girders, ties can be made of flexible materials like steel cables. Sticks, strings and structures was inspired by a learning activity implemented by Edee Wiziecki at Franklin Middle School in Champaign. It challenges students to properly use a limited number of struts and ties to construct a model structure that will carry a given load.

Materials and Equipment:

Each team will need:

A. 6 wooden struts made of craft sticks or tongue depressors
B. 2 strings tied with electrical ring tongue terminals at each end
C. 5 No. 6-32 x 3/4" machine screws
D. 14 No. 6 washers
E. 7 No. 6-32 machine hex nuts
F. 1 spring scale or fish scale capable of applying at least 5 pounds of force to a model structure
G. 1 1/4" hardboard test fixture that measures 14" wide and 24" long
H. Access to a bench vice.

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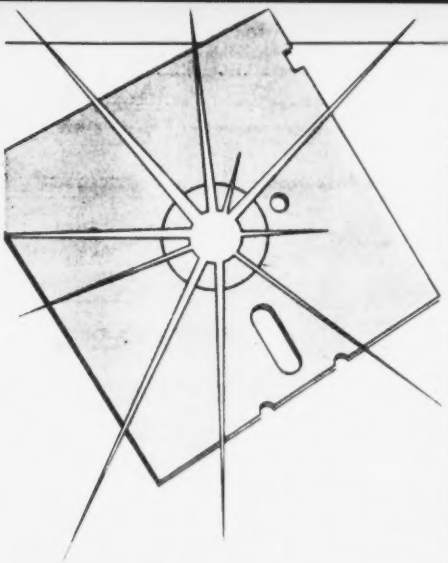

Software Review

Exploring Science: Temperature

Enhance your Energy Utilization course with Exploring Science: Temperature. This software package turns your microcomputer into an electronic thermometer. The program comes with three temperature probes which easily plug into the Apple IIe game port. Exploring Science: Temperature allows students to use up to three temperature probes to simultaneously monitor temperatures ranging from -20° C (0° F) to 120° C (240° F), thus allowing students, during an Energy unit, to track and record the temperature inside three separate solar collectors at one time. In addition, the program allows the students to collect data for any period of time up to 24 hours. The computer can record the information in any one of four different display modes, including time-vs.-temperature line graph, and a large digital display. The program also provides enough storage capacity for over six thousand data points, as well as built-in statistical functions so that students can quickly and easily perform calculations over the measurements. Once collected, any segment of the graph can be analyzed using the "zoom" function, saved and stored for later use, and/or printed. The program includes an easy-to-understand teacher's guide containing experiments and supplemental curriculum materials.

Exploring Science: Temperature requires 64K of memory, a disk drive and is available for the Apple II+, IIe, IIc, and IIgs computers. The program costs approximately $120 and is published by Sunburst Communications, 39 Washington Avenue, Pleasantville, New York 10570-9971. For more information call 1-800-431-1934.

AutoSketch 3.0

Autodesk, creator of AutoCAD, in the mid 1980's introduced a powerful inexpensive CAD program called AutoSketch. Since then, AutoSketch has been used very effectively to introduce students to the world of computer-aided drafting. AutoSketch has recently undergone a facelift. The newly enhanced version sports a more intuitive interface featuring pull-down menus, zoom, scroll bars and slider bars to make on-screen details easier to locate. Additionally, easy-to-understand icons can be used to select patterns, fonts, and drawings. AutoSketch 3.0 also includes associative dimensioning. Associative dimensioning automatically recalculates dimensions whenever dimensioned objects are edited. Text editing has also been updated. Text editing can be done using a large scrollable dialog display. The text editor will enhance the student's ability to manipulate text within the drawing layout using line and column numbers to track cursor locations. Also students can simply perform repetitive tasks automatically. Macro files can keep a log of all commands, keystrokes, and modifications, and store the information in a user-readable file. Once a desired sequence has been recorded, it can be repeated by choosing the play macro. Enhanced drawing tools include variable line widths (polyline) and ellipse commands. Fillets and chamfers support several line, arc, circle, polyline, and fill pattern combinations.

Memory capabilities of the program have also been improved. You can use up to 2 MB expandable/extended (VDISK) memory for larger drawings. With the new version, students can create up to 200% larger drawings than with the earlier version, 2.0.

Finally, AutoSketch 3.0 uses Autodesk's industry-standard DXF file format, allowing students to import and export drawings to any program that accepts DXF files, including AutoCAD and a wide selection of desktop publishing packages. AutoSketch 3.0 is available for IBM PC's/XT/AT or 100% compatible systems with 512K RAM minimum, a hard drive, and a floppy disk drive. The program costs approximately $125 and is published by Autodesk, 2320 Marineship Way, Sausalito, CA 94965. For more information, call 1-800-251-9935.

Free CNC Software

Are you wanting to teach students about high tech topics like CAD, CNC, and CAM, but your budget cannot support the cost of the equipment? An alternative method for teaching such topics and still providing students a hands-on experience is through the use of computer simulations. Now you are thinking, "With my budget, I cannot even afford the software." Well, worry no more. D&M Computing, Inc., through Aidex Corporation, is offering for a limited time FREE complimentary copies and site licenses for a CNC lathe emulation software program, Computer Numerical Control (CNC) Emulation Software Program.

The CNC Lathe Level II software program is an off-line system especially designed to teach students about computer numerical control. The software features menu-driven programming. Using a standard keyboard, students will be able to program incremental or absolute programs utilizing G and M codes. After programming, students can access an array of editing features, including adding, deleting, replacing, inserting, and listing part of the program. In addition, the software program contains five canned cycles, including turning, tapping, and facing. Once finished, students can preview the program through a graphical on-screen emulation. The on-screen emulation allows the students to verify the tool path and illustrates what the finished part would look like if manufactured. If money is available, you can interface the computer-driven software with a D&M CNC lathe, and actually have students produce the part.

The system is available for both Apple II (IIe and IIgs) and IBM PC computers. For more information, contact Aidex Corporation at 1-800-251-9935. Do not miss out on this unique opportunity to introduce students to computer numerical control.

Sticks, Strings, and Structures

(continued from page 4)

I. 1 problem template on an 8 1/2" x 11" sheet of paper
J. 4 pieces of masking tape
K. 1 plastic bag for storing struts, ties, and assorted hardware

Preparing Materials:

1. Obtain the materials listed above. The craft sticks will be used to make struts and they can be purchased at an arts and craft store. You will need to drill holes in the ends of each strut so they can be fastened together in triangular shapes. For the best results, stack several craft sticks on a piece of scrap, use a drill press to drill the holes. Begin by drilling small pilot holes and work your way up to an 1/8" drill. Make sure you maintain the same distance between the holes on each strut. If splitting becomes a problem, double the thickness of each strut by gluing two craft sticks together.
2. To make the ties, crimp an electrical ring tongue to the end of a piece of heavy string. Thread the other end of the string through a second ring tongue so the eyelet is facing in the opposite direction as the first ring tongue. Adjust the second ring tongue so the distance between the eyelets is the same as the distance between the holes on the struts and crimp it into position. Cut off the excess string and repeat the process until you have enough ties to meet the needs of your largest class.
3. Using the illustrations as a guide, develop at least three different problem templates. Duplicate enough problem templates to accommodate all your classes. Position a problem template on the upper third of each test fixture, fasten it with masking tape, and drill holes through points A and B. Make sure the distance between points A and B will accommodate two struts bolted together in the middle.
4. Create workstations by vertically mounting the hardboard test fixtures in bench vices throughout your laboratory. Arrange the workstations so neighboring workstations feature different problem templates. Place a plastic bag of components (i.e., 2 ties, 6 struts, and assorted hardware) at each workstation.

Posing the Problem:

Divide the class into teams and assign each team a workstation. Ask each team to design, build and test a structure that will span the distance between points A and B, carry a vertical 5-pound load applied at the point indicated, and fit within the boundaries of the problem template. Circulate around the room and provide individual instruction as needed.

After each team has developed and tested a structural solution to their assigned problem, have them trace an outline of their structure on to the problem template fastened to their test fixture. Ask them to disassemble the structure, put the components back into the plastic bag, and remove the problem template from the test fixture. Next, require each team to describe how their structure works by labeling which structural components were under compression and which were under tension while under the load. Lastly, have them put their names on their problem template and turn it in for laboratory credit.

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